Tasmania

MINERAL RESOURCES TASMANIA
DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES

A Division of the Department *of* Infrastructure,
Energy *and* Resources

Annual Review 2002/2003

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Mineral Resources Tasmania

Mineral Resources Tasmania serves the people of Tasmania by the provision of services to the mineral exploration, mining, quarrying and mineral processing industries, and the provision of geoscientific information to all levels of government, the private sector and the community.

— Mission —

- To contribute to the economic development of Tasmania by providing the necessary information and services to foster responsible land management, and mineral resource and infrastructure development, for the benefit of the Tasmanian community.

— Objectives —

- Benefit the Tasmanian community by an effective and co-ordinated government approach to mineral resources, infrastructure development and land management.
- Maximise the opportunities for community growth by providing timely and relevant information integrated with other government systems.
- Optimise the operational performance by MRT by developing the organisational structure to support the whole-of-Government business processes.

— Activities —

Activities within the Division include:

- Collection, integration, interpretation, publication and presentation of geoscientific information.
- Collection, integration, interpretation, publication and presentation of information promoting Tasmania's mineral resource potential, and land stability and groundwater issues.
- Issue of legal titles to mining tenements, collation and recording of statistics relating to mining production, collection of fees and rentals, management of royalty regimes, and recording of mining tenements.
- Regulation of mineral and petroleum exploration in Tasmania, including offshore waters administered by the State, and the promotion of vacant areas available for onshore and offshore exploration.
- Environmental appraisal, monitoring and management of mining heritage and land access issues.
- Setting and monitoring of standards for both the performance of exploration activities and the technical reporting of exploration records and case histories.

— Major Issues and Initiatives for 2003/2004 —

- Continue the upgrading of data for the Tasmanian Information on Geoscience and Exploration Resources (TIGER) system;
- Undertake a series of promotional activities to encourage mineral exploration in Tasmania, including promotion of the 3D model of geological structure and major mineralising pathways of Tasmania;
- Produce a land stability map of the Launceston urban area, in line with the guidelines developed following the Thredbo disaster;
- Continue rehabilitation of abandoned mining sites in Tasmania;
- Undertake Stage 2 of the core library extension.

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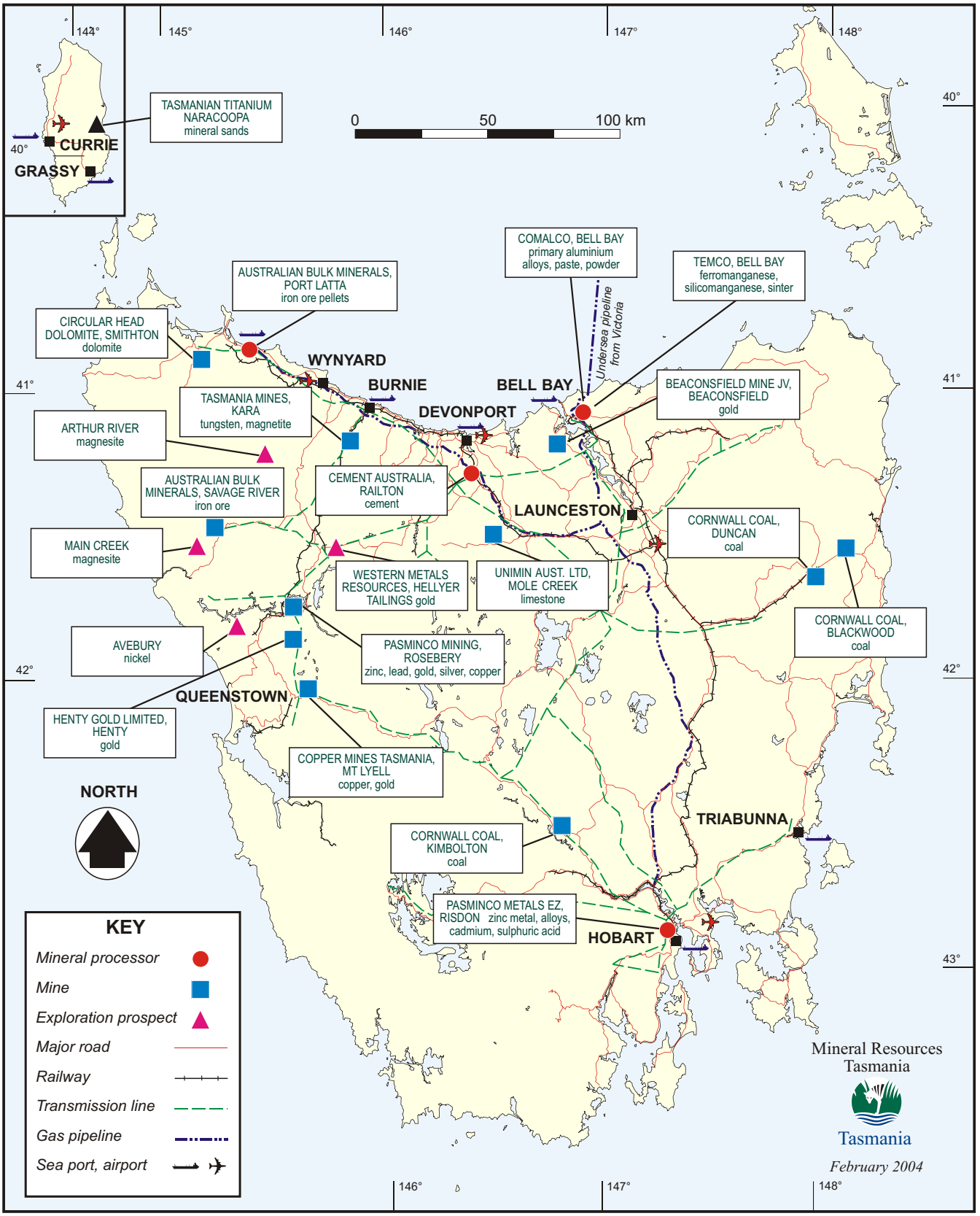
Tasmania — Infrastructure, Major Mining and Mineral Processing Operations



Mineral Resources Tasmania — Divisional Overview, 2002/2003

The mining industry in Tasmania again experienced difficult conditions during the 2002/2003 financial year, with continuing low commodity prices. Both the Rosebery zinc and Beaconsfield gold mines continued to perform strongly, despite remaining in the hands of administrators. Capital investment at Rosebery resulted in the completion of a decline to access the orebody, which will result in substantial cost savings that will further improve the economic viability of the mine.

On a positive note MRT's staff continue to upgrade Tasmania's geoscientific data bases and provide end-users with a greater variety of products and easier ways to access our information with further enhancement using the World Wide Web.

I wish to thank all MRT staff for their continuing commitment and high quality of outputs which are allowing MRT to 'lead the way' in presenting data and information in electronic as well as hard-copy formats.

Other areas of positive activity included resource drilling at the Beaconsfield gold mine, which augmented reserves. The improved operating performance of the mine plant resulted in increased gold production and a stronger operating profit. Exploration of the Avebury nickel deposit, near Zeehan, by Allegiance Mining NL continued to be successful and the company has made a decision to develop a mine. A development application for the first stage of the project, the construction of a decline to access ore, has been lodged with the West Coast Council. The major Canadian gold producer Placer Dome Inc. took over AurionGold during the year and decided to retain ownership of the Henty mine and to continue exploration on the mining lease.

Australian Bulk Minerals reported that it had signed a five-year contract in July 2002 to supply BHP Billiton with 1 to 1.25 million tonnes of iron ore pellets per year. Cost savings are being achieved through the conversion of the furnaces at Port Latta to burn natural gas instead of oil, and improvements in iron ore prices have further strengthened the viability of the operation. Studies are underway to extend the life of the mine beyond five years by converting to an underground operation.

The Thylacine gas discovery in permit T/30P and the Yolla gasfield are both in Tasmanian waters and are to be developed in the near future. The gas from both these fields will be piped to Victoria.

Major issues affecting MRT in 2002/2003

- Completion of the final phase (Phase Four) of Project TIGER (Tasmanian Information on Geoscientific and Exploration Resources) within the given time frame and budget.
- Completion of the recommendations of the first phase of the Western Tasmanian Regional Minerals Program using funds allocated by the Commonwealth for this purpose.
- Historically low levels of mineral exploration, leading to government initiatives to stimulate the sector.
- Provision of an appropriate level of resources for environmental monitoring of exploration and mining tenements, and for inspection of mines and quarries.
- Completion of the core library inspection facility.

Achievements against strategies identified for 2002/2003

New initiatives to stimulate mineral exploration in Tasmania

According to the Australian Bureau of Statistics, investment in mineral exploration, for minerals other than petroleum, was at a record low of $4 million in 2001/2002. The Tasmanian Minerals Council (TMC) held a meeting on ways to address this situation in May 2002, following which the Tasmanian Government, after consultation with the TMC, undertook to spend $300,000 to fund a study to produce a new three-dimensional geological model of western Tasmania. An

integrated exploration database and a prospectivity analysis for western Tasmania are being undertaken as part of the modelling project. This project is being conducted by the Predictive Mineral Discovery Cooperative Research Centre at the University of Melbourne, with input from MRT and the CODES Special Research Centre at the University of Tasmania. The project is currently on track and is due for completion by October 2003.

Promotion of mineral and petroleum potential

The Tasmanian Government provided $125,000 in 2002/2003, through the Department of Economic Development, to actively market mineral exploration opportunities in Tasmania. Activities undertaken included the production of a promotional CD, and the holding of a display and presenting a paper at the world's leading exploration forum, the Annual Meeting of the Prospectors and Developers Association of Canada (PDAC). A display highlighting the new geological compilation of the highly prospective Mt Read Volcanics belt, prepared as part of the Western Tasmanian Regional Minerals Program, was presented at the Mining 2002 meeting in Brisbane in November.

Promotional missions and functions were conducted in Perth, Sydney, Brisbane and Melbourne. These visits were led by the Deputy Premier and included Tasmanian Minerals Council and MRT representation. New information, resulting from activities during the Western Tasmanian Regional Minerals Program and the improved client access to MRT information using the TIGER information management system, was well received.

These promotions have been successful and have played a direct part in attracting three new exploration companies to Tasmania and the generation of new exploration projects with a projected total expenditure of over $2.5 million.

Four offshore petroleum areas were released for bidding in 2002/2003. These areas, in the Sorell and Otway basins off the west coast and in the Bass Basin to the north of Tasmania, were actively promoted at the Australian Petroleum Production and Exploration Association conference held in Melbourne in March 2003. Bids were received for two of these areas, with bidding for the other two areas closing in September 2003.

Collection, integration, interpretation, publication and presentation of data

The development of the TIGER information management system was completed during the year and MRT's geoscientific information is now available through the MRT website. A single geoscience data model was developed with user interfaces for groundwater, geohazards, geophysics, drilling, mineral deposits, samples and geochemistry. This information is now available to clients using the MRT website and is in addition to the tenement and document information already released. Two staff have been employed to continue maintenance and development of this information management system.

The collection and presentation of information on Tasmania's mineral wealth and geoscientific nature continues. Ten 1:25 000 scale geological maps were prepared for digital capture. Data capture/output was completed for fifteen areas. Because priority was again given to field checking of Western Tasmanian Regional Minerals Program geophysical data, primary geoscientific data acquisition was suspended for the year. Compilation of two map sheets, on which field work had previously been finalised, was completed during the year.

Digital maps of the Great Forester River and Meander River catchment areas were produced at 1:100 000 scale for a joint project with the Department of Primary Industries, Water and Environment. The available information on groundwater in Tasmania was redesigned as part of the TIGER project and is now available to the public through the MRT website.

Compilation of a series of maps, designed to provide information to land use planners in an easily understood format, has continued. This information will allow local government and land and infrastructure planners to make informed decisions relating to development, zoning and land-use activities. The maps include information on mineral prospectivity, location of mines and quarries, location of

current exploration licences and mining leases, construction material locations, and areas subject to land stability problems. Information on groundwater prospectivity is also being gathered. Forty-nine 1:100 000 scale maps, in three themes, cover Tasmania. These maps have been distributed to nineteen municipal councils under the auspices of the Tasmanian Government's Partnership Agreement.

Land instability is a significant hazard in Tasmania, with many homes having been destroyed over the years while significant damage has been caused to infrastructure. By studying and understanding the landslide hazard it is often possible to minimise the affects of land instability. MRT is actively addressing this hazard in three main areas:

- A regional landslide hazard assessment of the greater Hobart area is being undertaken, drawing on a methodology that was devised in the previous year using a combination of geological, geomorphological and geotechnical information. The resultant hazard classification maps will assist councils to make informed decisions on planning issues, especially given the pressure from property developers to subdivide marginal lands.
- A database has been developed to store all Tasmanian landslide information as part of Project TIGER. This database has been built to meet international standards and will be available to stakeholders via the internet. Such information can be critical during times of emergency or for long-term planning purposes.
- For many years MRT has monitored several landslips in northern Tasmania that have affected roads, railways and subdivisions. A review of the survey results has been undertaken and this information will be combined with detailed maps based on recently obtained orthophotos and topographic contours. The reports to follow will allow affected stakeholders to better manage these problem features.

Revision of existing landslide advisory zoning maps of the Launceston urban region was undertaken and seven new digital maps were produced. Work commenced on a 1:500 000 scale map of Tasmania depicting areas of landslide risk.

Western Tasmanian Regional Minerals Program (WTRMP)

A Reference Group, with an independent chairman and members drawn from the Tasmanian Minerals Council, the Department of Industry, Science and Resources, and MRT, developed a series of projects to implement the geoscience infrastructure recommendations of the Final Regional Development Plan of the Western Tasmanian Regional Minerals Program.

Projects utilising the WTRMP geophysical data to re-evaluate the geology and mineral potential of the Mount Read Volcanics and the aureoles of Devonian granites, the two most important mineralised rock associations in western Tasmania, have been partially completed. The former project has identified new exploration opportunities and has been partly responsible for attracting new exploration companies to Tasmania and two new projects, which are estimated to involve over $1.6 million of exploration in their first two years.

Three maps, showing the bedrock geology in the South Darwin Peak to Hellyer, Elliott Bay to Macquarie Harbour, and Que River to Sheffield areas, were completed and six maps were produced for the Devonian Granite Aureole Mineralisation Project.

As a result of remodelling of the Devonian–Carboniferous granitoids, a new 1:500 000 scale map showing the major granitoids of Tasmania was produced.

Aeromagnetic and radiometric data acquired over King Island and western and northwestern Tasmania were released in October 2001 and extensive ground checking of unexplained anomalies has been completed. The data have provided a new insight into the geology of the area and form the basis for a number of value-adding sub-projects, including geophysical interpretations of the data and new geological maps of the highly prospective Mt Read Volcanics.

Helicopter-based acquisition of approximately 15 600 line kilometres of electromagnetic data over several areas of western Tasmania was completed in

April 2002 and a series of interpretational products, developed in a joint project with the University of Tasmania, have been progressively released this year.

A collaborative study between MRT, Geoscience Australia and the National Centre for Petroleum Geology and Geophysics to improve the knowledge of the petroleum potential of the offshore Bass and Sorell basins continued during the year. A set of CDs presenting the final results of this study was launched at the Australian Petroleum Production and Exploration Association conference in March 2003.

All technical documents relating to onshore and offshore exploration, and MRT technical reports, have been scanned to allow on-line viewing on the Internet and downloading for local viewing or hardcopy production. Use of the MRT website has increased steadily throughout the year, from eight gigabytes in July 2002 to almost 50 gigabytes in June 2003.

Setting and monitoring of standards for exploration activities

MRT is responsible for ensuring that all exploration activity in Tasmania achieves the highest environmental standards and complies with the *Mineral Resources Development Act 1995* and the requirements of other legislation which protects, for example, threatened species and cultural heritage. The fourth edition of the *Mineral Exploration Code of Practice* outlines the current requirements, the approvals process, and the controls and monitoring procedures that MRT has in place. If resources permit a fifth edition of the Code will be produced during the coming year.

During the year thirty-two exploration work programs were submitted to and approved by MRT. Of these, eleven were in reserves derived from the Regional Forest Agreement (RFA) and required assessment by the Mineral Exploration Working Group.

To comply with the Regional Forest Agreement, Mineral Resources Tasmania has developed a system to spatially record exploration activity and attributes that chart the process of approval of individual work programs. All work programs, whether on Crown land, State Forest or private property, are entered on this system to give a complete record of all the environmental information relating to exploration. The system has also been designed to provide ongoing information on the outcomes of rehabilitation of exploration activity. Compliance auditing of this system requires verification that the agreed approval process is adhered to and that derived statistics reflect the RFA and the recommendations of the Resource Planning and Development Commission. A Business Process Analysis of this system was undertaken during the year by consultants. The major recommendation was that the system should be upgraded to fully comply with the auditing requirements under the RFA and to be compatible with the new TIGER system.

Rehabilitation of Mining Lands Trust Fund

The funding to rehabilitate abandoned mines comes from an agreement with the mining and quarrying industries whereby a proportion of the royalty increase introduced in 1995 was to be allocated for rehabilitation.

In 2002/2003 major works were completed at abandoned mines in northeast Tasmania. Erosion control and revegetation works were carried out at the Endurance mine near Gladstone, while jig tailings stockpiled on the bank of Storys Creek were relocated to a repository where the tailings were encapsulated and revegetated. This program was jointly funded by RiverWorks Tasmania and the trust fund.

Safety work continues to be carried out at abandoned mine shafts, with a shaft at Mathinna being filled and work commencing on the capping of a shaft at the Florence mine at Zeehan.

Smaller scale works included revegetation at gravel pits near Sheffield and Beaconsfield and gorse spraying at the Queensberry mine site near Zeehan.

Special initiative — Core Library

This project has been finalised with the completion of the inspection facility in 2002/2003.

Royalty Assessment

MRT is responsible for the collection of mineral royalties from Crown land tenements. Royalty is not a tax but a payment to the community for the purchase of the State's non-renewable resources.

The Tasmanian royalty regime operates under two systems depending on the type of resource recovered. Companies producing a metallic mineral or coal pay under a two-tiered system where royalty is paid on the net sales and profit of a mine. Royalty on the recovery of non-metallic minerals on Crown leases is set on a per cubic metre or per tonne basis.

MRT conducts a royalty audit program to ensure tenement holders are paying in accordance with the Legislation. Mine and quarry inspections are also undertaken by Inspectors of Mines to determine the quantity of material taken from a tenement.

Mineral royalties totalling $4.5 million were collected during the 2002/2003 financial year. Royalty revenue for the year was significantly lower than previous financial years due to a number of factors affecting the cash flow available to Tasmanian mines. Commodity prices generally continued at very low levels for the year, with gold being an exception, while the rising value of the Australian dollar reduced revenue received for commodities priced in Australian dollars. During 2002/2003 the Renison tin mine went into voluntary administration after struggling with low tin prices for some time.

Centre for Ore Deposit Research, Special Research Centre (CODES-SRC)

Funding is provided by the Tasmanian Government, through MRT, in conjunction with the Commonwealth Government and industry, for support for the CODES-SRC at the University of Tasmania. The Tasmanian Government allocation is used to part-fund honours scholarships, and thus help increase the knowledge of Tasmanian geology, particularly in the important fields of economic geology and mineralisation. MRT's library receives a copy of each thesis, which is available for reference use.

Future Initiatives

The major issues and initiatives for 2003/2004 are to:

- enhance provision of geoscientific data through the Tasmanian Information on Geoscience and Exploration Resources (TIGER) system;
- undertake a series of promotional activities to encourage mineral exploration in Tasmania which is currently at a low level;
- complete the 3D model of geological structure and major mineralising pathways of Tasmania to provide new information for explorers;
- produce a land stability map of the greater Hobart area, in line with the guidelines developed following the Thredbo disaster;
- complete the series of planning information maps with regard to groundwater;
- complete the second (final) phase of the Western Tasmanian Regional Minerals Program study; and
- continue rehabilitation of abandoned mining sites in Tasmania.

Dr A. V. (Tony) Brown
Director of Mines and State Chief Geologist

Financial Performance

Detailed financial information on the operations of Mineral Resources Tasmania is published in the Department of Infrastructure, Energy and Resources Annual Report to Parliament. Budget Papers can be viewed on the State Treasury website at www.treasury.tas.gov.au.

The 2002/2003 consolidated fund appropriation to Mineral Resources Tasmania was $5.604 million. This funding consisted of:

- $3.185 million for salaries for 54 full-time-equivalent staff;
- $2.001 million for operating expenditure including rent; and
- $0.418 million for administered payments ($350,000 Restoration of Degraded Mineral Lands and $68,000 grant for the Tasmanian Government Mining Scholarships at the University of Tasmania CODES-SRC unit).

The operating budget increased for 2002/2003. MRT received $283,000 from the Tasmanian Government's Land Information Infrastructure Fund for the ongoing operation and maintenance of the TIGER system and $90,000 for MRT to help support the government's infrastructure information network which includes support for the Road Information Management System (RIMS). MRT also received funds for salary indexation negotiated under the State Service Wages Agreement.

The 2002/2003 appropriation also included year two funding of the two-year $1.5 million from the Infrastructure Fund for the completion of the TIGER project.

The operating budget continued to be put under pressure due to rising operating costs, particularly the costs associated with unfunded salary increments. MRT was also required to contribute $25,000 towards the Agency contingency fund.

MRT continues to keep a tight control over expenditures to ensure that the Division gets value for its limited funding, in light of the rising costs in delivering the outputs.

Tasmanian government agencies are funded on an outputs basis. The outputs represent the goods and services delivered by MRT, and the cost of delivering those services. The government purchases these goods and services to meet policy objectives. MRT has two outputs.

Outputs — Application of Funds, 2002/2003

	$'000
1. Minerals exploration and land management	2,878
2. Tenement management of the exploration and minerals industry	2,308
Administered payments	418
Total	**5,604**

Descriptions of Outputs and Outcomes, 2002/2003

1. Minerals exploration and land management

This output covers:

- the provision of geoscientific data and resource information on Tasmania's metallic, industrial, and hydrocarbon mineral endowment;
- promotion of mineral potential for the stimulation of exploration for metallic and industrial minerals and hydrocarbons; and
- geoscientific database development, maintenance, output and marketing, including the production of digital geoscientific maps and associated databases.

This will have the resultant outcome of dynamic minerals exploration and land management for Tasmania and offshore waters.

2. Tenement management of the exploration and minerals industry

This output provides for:

- the provision of geoscientific information essential for the effective and sustainable management of land and mineral resources;

- provision of advice to all levels of government and the public on land management issues;
- administration of mining legislation, including the issue of legal titles for mineral tenements;
- collation and recording of statistics relating to mining production and exploration; and
- the demand and monitoring of the collection of fees, rentals and royalties.

This will have the resultant outcome of effective and efficient tenement management of the exploration and minerals industry.

Mineral royalties and Departmental fees and charges

Mineral Resources Tasmania collects royalties and rents and fees from mineral lands. These revenues are forwarded directly to consolidated revenue and are not available to MRT.

Royalty revenue for 2002/2003 was $4.5 million. This was a significant reduction from the $8.0 million collected in 2001/2002, which was also below budget estimates. The estimated royalty collection of $8 million for 2002/2003 was not met due to a number of factors affecting sales revenue and profitability of the major metallic mines. Individual mine reports in this review discuss production and profitability of mining operations.

Base metal markets remained generally weak in 2002/2003, with gold and iron ore being exceptions. The fact that the Australian dollar remained relatively weak against the United States dollar helped bolster commodity prices in Australian dollar terms. Many companies were unfortunately unable to take advantage of the favourable exchange rate as they continued to struggle with currency hedging programs that had punted on a high Australian dollar : United States dollar exchange rate which did not eventuate. As the royalty regime does not include hedging gains and losses in the calculation of royalty, these arrangements do not affect the royalty revenue to government except in regard to the company's ability to pay.

The major impact on royalty revenue was the fact that two major mines were experiencing serious cash flow difficulties through out the year and were unable to pay royalty. These cash flow difficulties were the result of the continued low commodity prices as well as poor currency hedging programs. The Renison tin mine eventually went into administration in June 2003.

Mineral Resources Tasmania also collects rents and fees from mineral lands, which are forwarded directly to consolidated revenue.

Rents and fees from mineral lands raised $0.812 million in 2002/2003, which was approximately the same as the revenue collected for the previous year. Revenues in the past two years have been higher because of the higher average area of licence size, increased dealings, and the Duke Energy gas pipeline licence.

Sales of maps and publications revenues have declined as expected because of the effect of some MRT maps, data and reports being made available for free download via the Internet. Maps and data are also made available free to other agencies as well as stakeholders under partnership agreements. The downturn in the exploration industry has also impacted on demand.

	Target 2002/2003	*Actual 2002/2003*	*Target 2003/2004*
Royalties ($,000)	8,000	4,541	7,000
Rents & Fees ($,000)	747	812	747
Sales of Maps and Publications ($,000)	15	13	15

Royalty regime

MRT is responsible for the collection of mineral royalties from Crown land tenements. Royalty is not a tax but a payment to the community for the purchase of the State's non-renewable resources.

The Tasmanian royalty regime operates under two systems depending on the type of resource recovered. Companies producing a metallic mineral or coal pay under a two-tiered system where royalty is paid on the net sales and profit from a mine. Royalty on the recovery of non-metallic minerals on Crown leases is set on a per metre or per tonne basis.

The two-tiered metallic and coal royalty consists of an ad valorem percentage payable on net sales, and a formula-based percentage of profits. This system requires mining companies to pay a fixed percentage of sales in royalty for ore extracted, and allows the community to benefit further in good times when a company is making a profit.

Following negotiations with the mining industry, new royalty rates were approved in August 1997 with the regime taking effect from 1 July 1997. Non-metallic rates increased from $1.00 per cubic metre to $1.20 per cubic metre, while it was agreed that metallic minerals and coal royalties would be increased incrementally over a number of years.

The ad valorem rate for net sales is 1.6%. The profit component of the royalty regime is calculated via an exponential formula which increases the percentage of profit royalty paid as the mine's profit increases.

A royalty cap of 5% of net sales has been set so that high-cost, short-life mines are not discriminated against.

Mining companies that expand into downstream processing to produce a near pure specific metal can apply to the Treasurer to receive a 20% rebate on royalties payable. Companies that produce gold doré can apply to claim a 10% rebate on royalties.

The Treasurer has the discretion to increase the gold doré rebate to 20% depending on criteria such as the magnitude of investment undertaken and the benefit to the Tasmanian economy from the investments.

Major contracts awarded over $50,000

Contractor	*Location*	*Tender*	*Period of contract*	*Estimated value of tender ($)*
Geo Instruments Pty Ltd	Ramsgate, NSW	Air electromagnetic and magnetic survey	10/2000–8/2002	680,435
Document Control	Hobart, Tasmania	Document scanning	10/2000–current	450,000
Gradco Pty Ltd	St Leonards, Tasmania	Storys Creek jig tailings relocation	11/2002–5/2003	382,808
Joe Fagan Heavy Haulage	Waratah, Tasmania	Mt Bischoff rehabilitation	5/2003–current	92,717

Consultancies over $50,000

Consultant	*Location*	*Tender*	*Period of contract*	*Estimated value of consultancy ($)*
Geometry Pty Ltd	Hobart, Tasmania	Geoscience data model	8/2002–5/2003	78,000
Pitt and Sherry Consulting Engineers	Hobart, Tasmania	Mt Bischoff rehabilitation	11/2002–current	93,800

Consultancies less than $50,000

Consultant	*Description of consultancy*	*Value of consultancy ($)*
John Miedecke & Associates	Storys Creek: jig tailings management	23,000
Wise Lord and Ferguson	Project TIGER: Business Improvement Consultancy	37,500
Saunders and Pitt	Rosny and Mornington rental valuation	3,500
Oracle Corporation Australia Pty Ltd	Project TIGER: Oracle Discoverer implementation	30,000
Deloitte Touche Tohmatsu	Project TIGER: Business analysis of exploration work program approvals and monitoring of mineral tenements	40,000
Thompson & Brett	Florence shaft cover: design and manage construction	7,091
John Miedecke & Associates	Mt Bischoff: rehabilitation review	5,500

2002/2003 Performance Indicators

Growth in mineral exploration activity is essential for future development of the mineral sector and for the economic well being of Tasmania. Exploration activity is underpinned by updating and providing high quality geoscientific data relating to Tasmania's mineral resources. The activities of MRT are directed at the capture, storage and promotion of such information, with the increased availability of this information being measured and correlated with exploration investment. Enhancement of geohazard information is also of high importance to stakeholders of MRT, as is the effective administration of MRT's regulatory framework.

Achievement against internal targets

Action	*Target*	*Result*
Provide new data in areas with inadequate geoscientific coverage.	1. Collection of at least 200 km^2 of primary digital geoscientific coverage per year. 2. Production of digital geoscientific coverage of ten 1:25 000 scale map equivalents per year.	1. No primary digital geoscientific coverage collected; resources utilised on WTRMP interpretation. 2. Fourteen 1:25 000 scale maps produced. Work on seamless 1:25 000 scale coverage of Tasmania continued.
Research and promotion of exploration of Tasmanian petroleum basins.	Promote one offshore area per year.	Four offshore areas released and promoted at the APPEA conference.
Promote the geoscientific and mineral endowment aspects of Tasmania at various shows, industry conferences, press conferences, open days and other events.	Successful and timely presentation of promotional material at appropriate venues.	Direct promotional visits were made to companies in Canada and Australia. PDAC conference attended in Canada and Mining 2002 conference attended in Brisbane. A promotional CD was produced.
Prioritise and organise rehabilitation works on abandoned mining lands in compliance with the operation of the Abandoned Mining Lands Rehabilitation Trust Fund.	One major program to be completed each year.	Programs at former tin mines in the northeast and at Storys Creek continued.
Monitor environmental performance on exploration and mining tenements.	Field inspections as required.	Regular field inspections conducted. Compliance auditing system developed. Business Process Analysis of the system was undertaken.
Digital geoscientific coverage of Tasmania's geohazards.	Completion of one map per year.	Work commenced on a new landslip hazard map series. New geohazards database completed.
Digital geoscientific coverage of Tasmania's groundwater resources.	Completion of one map per year.	Map of the Meander River catchment area produced.

Achievement against external targets

Target	*2002/2003 result*	*2001/2002*
Increase exploration expenditure and maintain level at 2% of total Australian exploration expenditure.	Exploration expenditure increased marginally to $4.3 million in 2002/2003, although Tasmania's share of Australian expenditure declined to 0.59%.	0.63%
Increase level of exploration expenditure to a minimum of $30 million per financial year.		$4.0 million
Obtain an increase in the area held under Exploration Licence.	Area held under All Minerals and Non-metallic Exploration Licences decreased to 8391 km^2. A further 60 826 km^2 is held for onshore oil exploration.	8905 km^2
Obtain an increase in the number of Exploration Licences granted.	The number of Exploration Licences held increased to 127.	120
Obtain an increase in the metres of exploration drilling completed.	Exploration drilling decreased by 24% to 25 549 metres. This was driven mainly by a decrease in drilling on Mine Leases, which dropped by 31%. Drilling on Exploration and Retention Licences declined by only 7% to 9560 metres, despite total exploration expenditure on exploration and retention licences dropping by 18%.	31 442 m
Obtain an increase in the percentage of Strategic Prospectivity Zones (SPZ) held under EL's.	The percentage of land in SPZ areas held under EL's increased to 6943 km^2.	6386 km^2

There has been a steady decline in the proportion of national expenditure spent in Tasmania since the last national expenditure peak in 1996/1997. This is probably because:

- copper and zinc, the cornerstones of the Tasmanian industry, have been disproportionately affected by the slump in commodity prices;
- exploration expenditure has been severely impacted by the corporate failures of some companies mining in Tasmania, notably Pasminco, Renison and the Beaconsfield Mine Joint Venture partners;
- a trend for major companies to be targeting ever larger ore bodies. This places Tasmania, which is perceived by most companies to be less prospective for giant deposits than other States, in a less preferred position;
- amalgamations and takeovers among the medium to large mining companies, together with downsizing of exploration divisions and increased global competition, have decreased the number of exploration projects being undertaken; and
- Tasmania may be less attractive to junior companies as it is perceived as being remote at a time when venture capital in the mineral exploration sector is difficult to raise.

Mineral Resources Tasmania — Legislation and Committees

Legislation Administered

- Mineral Resources Development Act 1995
- Mining (Strategic Prospectivity Zones) Act 1993
- Petroleum (Submerged Lands) Act 1982
- Iron Ore (Savage River) Deed of Variation Act 1990

Statutory bodies

- Nomenclature Board

Non statutory bodies

- Ministerial Council for Mineral and Petroleum Resources (MCMPR) and associated Standing Committee of Officials Task Forces and Working Groups
- Chief Government Geologists Committee
- Government Geologists Information Policy Advisory Committee
- CODES-SRC Advisory Board
- Evaluation of Geoscience Australia's Geoscience Survey and Research Activities
- Land Information Coordination Committee (LICC)
- LICC Sub-committee — The List Management Advisory Group
- RFA Implementation Group
- Project TIGER Steering Committee
- Australian Society of Exploration Geophysicists Data Standards Committee
- Mineral Resources Industry Advisory Panel
- ABS Mining Statistics User Advisory Group
- Tasmanian Statistical Advisory Committee
- National Groundwater Committee
- DPIWE Application Assessment Panel
- Australian Urban Regional Information Systems Association (AURISA)
- Mining Heritage Committee
- Mineral Exploration Working Group
- Gas Approvals Working Group
- Project Managers and IT Managers Forum

Mineral Resources Tasmania — Branch Activities, 2002/2003

During 2002/2003 Mineral Resources Tasmania consisted of five branches: Metallic Minerals and Geochemical Services; Industrial Minerals and Land Management; Information Systems and Geophysics; Data Management; and Royalty, Finance and Administration.

Because of the integrated nature of the branches, outputs provided under the banner of the Tasmanian Geological Survey are contributed to by staff of most, if not all, branches.

Metallic Minerals and Geochemistry

During 2002/2003 the Metallic Minerals and Geochemistry Branch was involved in a number of projects and programs.

Western Tasmanian Regional Minerals Program (WTRMP)

Planning of projects was done in conjunction with Commonwealth Government, industry and MRT personnel.

MRT staff conducted field checking of features in the aeromagnetic and radiometric data in northwestern and western Tasmania. Two reports were completed by year's end on the Granite Tor and Elliott Bay areas, and comments were made on drafts of two other reports.

The study to recompile and synthesise the geology of Tasmania's main mineralised rock suite, the Mount Read Volcanics (MRV), continued with preparation of three reports on the MRV. The stratigraphy and rock units of the MRV have been rationalised and simplified. New ideas generated during the revision of the geology of the Mt Jukes–Mt Darwin area as part of the WTRMP were partly responsible for attracting a major new exploration project.

A new study was initiated into the mineral potential of Devonian granite aureoles. At year's end the first two of four reports had been received from consultants, a general report on the granite aureoles and another focussing on King Island.

A large part of branch time continued to be spent preparing images of WTRMP data for use by geological and geophysical contractors and MRT staff, and in discussions, contract preparation and planning sessions with contractors.

Posters of WTRMP geophysics and West Coast geology have been donated to the West Coast Pioneers Memorial Museum at Zeehan and have been well received.

Three-dimensional geological model of Tasmania

Following discussions with the Tasmanian Minerals Council, the Tasmanian Government commissioned the Predictive Mineral Discovery Cooperative Research Centre (pmd*CRC) to construct a three-dimensional geological model of western Tasmania using all available geoscientific data. The pmd*CRC subcontracted Geoinformatics Exploration Limited to produce the visual model based on information supplied. The work by the pmd*CRC involved construction of interpretive geological cross sections at ten or five kilometre intervals constrained by available geological and geophysical data. Independent geological contractors and MRT staff were involved in section compilation.

A unique feature of the work was integration of regional-scale data with detailed information from the major mines, the mine management generously providing data to be incorporated in the model. A regional study of this magnitude and detail was a world's first. The Centre for Ore Deposit Studies (CODES) at the University of Tasmania was contracted to produce digital maps of volcanic associations and rock alteration mineral assemblages to be incorporated in this model. By year's end the study had been extended to cover all of mainland Tasmania and with an added prospectivity analysis of the State. The work was on track for completion by October 2003.

Geoscientific data generation

Compilation of new primary geoscientific data was completed for the Temma, Balfour and Gog 1:25 000 scale map tiles in the form needed for digital capture.

Five of the ten geological map sheets captured by MRT during the year (St Helens, Tewkesbury, Wynyard, Beaumaris and Marrawah) were prepared for digital capture by the branch. The Tewkesbury and Wynyard sheets included limited field checking and incorporation of interpretations of WTRMP geophysical data, while the Marrawah sheet included geological interpretation of the geophysics.

Compilation of primary geoscientific data for the Temma and Balfour 1:25 000 scale map tiles in the form needed for digital capture continued. The WTRMP data are providing very useful information on the extent and spatial orientation of geological units and structures.

Work was successfully completed on the AMIRA-SPIRT isotope geochemistry project with companies and CODES-SRC to investigate new mineral exploration techniques relevant to the Mount Read Volcanics. An MRT staff member was working on a sub-project covering the Chester mine area, west of Tullah.

A report was submitted on a blue amphibole occurrence in northwest Tasmania. A paper on the geology of the Port Sorell region was published in the *Australian Journal of Earth Sciences*. A poster paper on the Forster gold prospect was presented at the Australian Geological Convention in Adelaide.

Database development

The main work of the branch for the year involved development of database structures for Project TIGER and verification and capture of data for incorporation in the new system.

Members of the branch made substantial contributions to the development of the geoscience data model and to the drilling, samples, geochemistry and observations and mineral deposits modules.

Information for the Australian Spatial Data Dictionary was updated and further data were migrated to the ORACLE platform.

A branch member attended a meeting of government geoscience agencies on database development and is co-ordinating activity among Australian jurisdictions.

Core library

The core library expansion project was finalised with the completion of the core inspection facility.

The high level of usage of the core library continued, with 85 visits during the year to inspect drill core, an increase of two on 2001/2002.

Large volumes of core continue to be sent by companies to the Mornington core library. The new storage facility is now full, with more core than can be accommodated stored on pallets. There is space for more core on pallets in the old storage area, but forward planning will be needed in the coming year for an additional extension to enable an orderly expansion of the facility.

The core library supervisor again visited the West Coast to inspect core that will be transferred to MRT in the future.

Mineral Exploration and Promotional Activities

Promotional missions were conducted to Perth in September 2002 and to Sydney, Brisbane and Melbourne during May–June 2003. These included visits to companies by two separate teams and promotional functions hosted by the Deputy Premier. Promotional displays were held at the Annual Meeting of the Prospectors and Developers Association of Canada (PDAC) in Toronto in March 2003 and at the Mining 2002 trade show in Brisbane in November 2002. Pre-convention visits were made to companies in Toronto as part of an Australian delegation. A Senior Advisor presented a paper for the Deputy Premier at the PDAC meeting that was well attended and received.

Substantial exploration programs have been proposed in licence applications that may be directly related to the promotional activities. These include a two-year, $1.4 million, project by Newcrest Limited south of Mount Lyell, that was initiated by a trade display held at the Giant Ore Deposits Workshop held in Hobart in June 2002, and a two-year, $200,000 project by Glengarry Resources NL that followed the promotional visit to Perth.

There was also evidence that data generated by the Western Tasmanian Regional Minerals Program (WTRMP) and the TIGER Project were stimulating exploration licence applications, especially in western Tasmania.

Articles, promotional material and information on mineral prospectivity and exploration activities in Tasmania were prepared for various specialist mining journals.

Several branch members made contributions to displays and presentations for the Mineral Resources Tasmania Open Day during Earth Sciences Week. In addition, the petrologist conducted displays and publication sales for the national gemmological symposium, held in Hobart, and the Hobart Gem and Mineral Exhibition.

Petrology

The petrologist supervises the petrological and lapidary laboratories, which service internal and external clients, as well as managing or supporting several projects and databases, and being involved with projects and general exploration administration. The other laboratory staff also have other duties outside of the petrology area.

Because of the need for more accommodation at Rosny Park for Workplace Standards Tasmania (WST), MRT's lapidary laboratory was moved to the Mornington complex. As part of the work, funded by WST, the core library supervisor's office and crib room were moved into the main core library area. This move improves the efficiency of operation of the complex with minimal loss of storage capacity.

The lapidary and petrology laboratories provided a total of $41,227 worth of analyses and services to the Department of Infrastructure, Energy and Resources ($17,100) and external clients ($24,127). Most of this external work cannot be otherwise conducted within Tasmania.

The lapidary laboratories prepared 348 standard thin sections, 153 polished thin sections and five miscellaneous sections, making a total throughput of 506 samples. Most of these were done on an as-needed basis by our field assistant; this work was valued at $13,380.

The technical officer for petrological services processed 430 samples by X-ray diffraction, including 197 quantitative dust analyses. He also conducted 112 soil and sizing tests and 75 optical asbestos identifications, a total of 619 samples processed, valued at $27,847. About half of his time was spent preparing samples for, and operating, the XRF for the geochemistry section.

A total of 499 external (contract) samples were received for investigation, mostly by X-ray diffraction. These samples include 315 for occupational health clients, 116 soils, 14 construction materials, 18 industrial samples, six water samples, one forensic sample and 17 other samples (mostly rocks). This external work came from a wide range of external sources, including Police Tasmania, other Government departments; the University of Tasmania (staff and students), various mining, mineral processing and mineral exploration companies, environmental and occupational health consultants, the general public and miscellaneous businesses.

Samples studied included geological materials (construction materials, mineral concentrates, ore samples, rocks, soils, sand and clay) and anthropogenic materials (including forensic samples, concretes, asbestos sheeting, industrial materials, dusts, etc.). Forensic studies continued with work for Police Tasmania and there was one court appearance in Devonport as an expert witness.

The petrologist presented talks to local schools and the National Gemmological Symposium.

The petrologist is helping update the Tasmanian gemstone booklet and posters, and update the list of designated fossicking areas. The *Catalogue of Mineral Occurrences in Tasmania* has been updated. The petrologist also handles numerous public and commercial enquiries on all manner of mineral, mining and rock-related matters, particularly in regard to mineral locations and identification, occupational health issues, and mine locations. The petrologist is also curator for MRT's rock and mineral specimens.

Geochemical Laboratory

During 2002/2003 the laboratory was staffed by a senior chemist and a technical officer. A geologist/geochemist and another technical officer provided part-time assistance. Although our sample preparation technician does most of the water analyses, the laboratory is undermanned because of the absence of a 'specialist' chemist/technician in instrumental/wet chemistry. Absence or leave of any personnel severely limits the ability of the laboratory to supply anything other than provisional results.

The laboratory generates the chemical/geochemical data necessary to maintain Mineral Resources Tasmania's databases. A total of 482 samples, consisting of 234 water samples, 213 rocks and 35 minerals or products, were submitted for 10,039 individual determinations during the year. This compares with 734 samples and 16,495 individual determinations in the previous year.

A total of 723 samples were assayed for 10,513 individual determinations. This compares with 633 samples and 13,701 individual determinations in the previous year. The 723 samples analysed comprised 354 waters, 121 rocks and 248 minerals or products.

Careful operation and maintenance has kept the XRF unit operating in a stable condition throughout the year. Updated Windows-based software allows data generated to be arranged for incorporation into the Tiger web-accessible database. Apart from saving time on the operation of the unit and data processing, this will further limit the possibility of data transposition errors. The provision of data in Excel format for the XRF, Laboratory Register of Chemical Analyses, and water data is currently being arranged. This will allow new data to be made freely available through the Tiger.

A further improvement to the sample preparation laboratory was a major upgrade to ensure compliance with air quality standards and OH&S requirements. This has given increased ergonomic effectiveness and optimisation of the sample preparation process, provided efficient sample preparation and a safer working environment.

Other activities

- The *Mining (Strategic Prospectivity Zones) Act 1993* was amended during the year. The main change was to extend the Beaconsfield Strategic Prospectivity Zone to better reflect the potential for gold, nickel and other minerals in the light of new geoscientific data acquired by MRT and Geoscience Australia.
- Branch members have been involved in planning for the Australian Geological Convention to be held in Hobart in February 2004.
- A report was submitted to the meeting of the Ministerial Council Indigenous Affairs Task Force.
- Four geologists attended a 2-day *ModelVision* geophysical modelling course. Four geologists attended all or parts of a geochronology course at the CODES Special Research Centre at the University of Tasmania.
- Mineral exploration report and exploration performance assessments were carried out as needed, as was preparation of promotional leaflets for Exploration Release Areas. Particular attention was placed on monitoring performance on exploration licences.
- Numerous meetings were held with industry and CODES-SRC and presentations were given to the Tasmanian Minerals Council Exploration Group on the Western Tasmanian Regional Minerals Program.
- Many requests for information on geology, mineral resources, minerals and related matters were received and dealt with promptly.

- Meetings of the Tasmanian Statistical Advisory Committee and the RFA Implementation Group were attended during the year.
- Safety audits have been carried out in the laboratories and core library, including the safe storage of radioactive mineral samples.

Industrial Minerals and Land Management

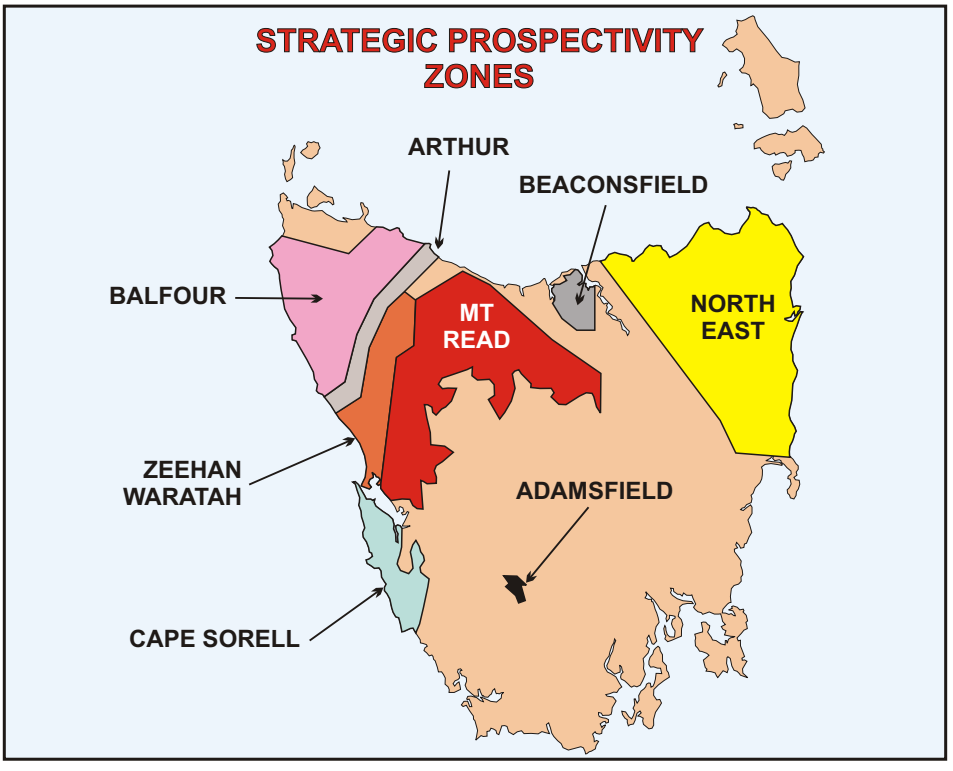
This branch is responsible for the investigation and promotion of industrial minerals, including coal and hydrocarbons, the management of mineral tenements, land access issues and environmental control of exploration activity, and the protection of mining heritage. It is also responsible for providing information for the management of groundwater resources and geohazards, especially land stability.

Strategic Prospectivity Zones

Strategic Prospectivity Zones (SPZ) cover 25 200 km^2 or 37% of Tasmania. The areas in each SPZ occupied by mining tenements at the end of June 2003 are shown below.

SPZ	Metallic		Non-metallic	
	Area (km^2)	Occupied (%)	Area (km^2)	Occupied (%)
Adamsfield	68.4	92.8	0.0	0.0
Arthur	100.90	9.11	310.26	28.01
Balfour	583.33	14.91	287.30	7.34
Beaconsfield	19.02	99.98	4.0	21.0
Cape Sorell	425.03	30.75	0.0	0.0
Mount Read	1200.45	16.73	37.02	0.52
North East	3036.43	31.27	320.47	3.30
Zeehan/Waratah	413.31	22.53	137.30	7.49

In comparison to last year's occupancy for metallic minerals, the Mount Read SPZ has decreased from 26.41% to 16.73%, the North East SPZ has increased from 12.4% to 31.27%, and the Zeehan/Waratah SPZ has decreased from 30.8% to 22.53%



Petroleum exploration

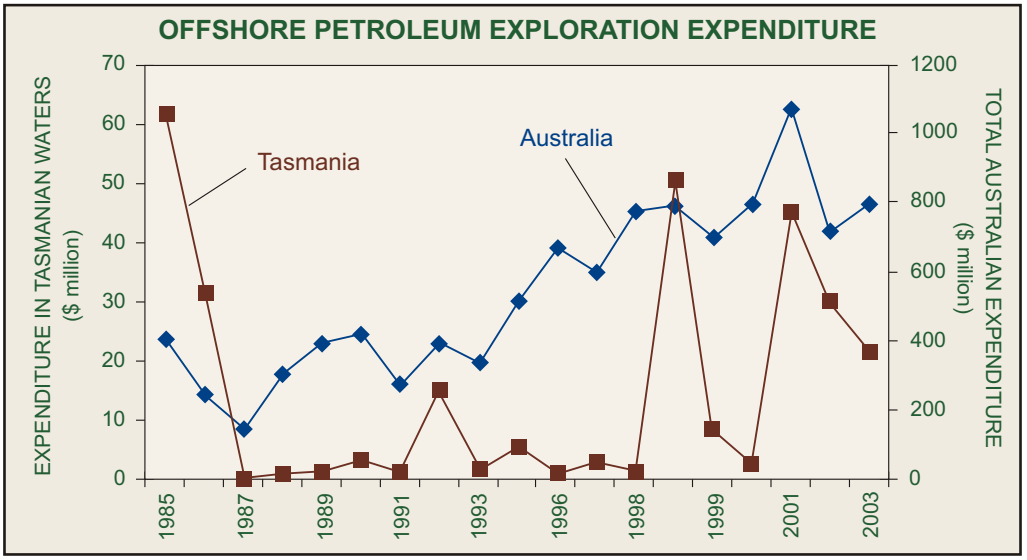
Four offshore exploration permits and one onshore permit are currently held for oil and gas exploration. A production licence is held over the Yolla gas/condensate field in the Bass Basin, and a retention lease is held over a small acreage adjacent to the Yolla field. A nomination for the purpose of declaring a location over the Thylacine gas discovery was made in early 2003. This is a precursor to the granting of a production licence. No hydrocarbons are produced in Tasmania or offshore waters, but gas production from the Yolla field is expected to commence in late 2004, and from the Thylacine field shortly thereafter.

The production licence over the Yolla field is held by a consortium headed by Origin Energy Resources Ltd and AWE Petroleum Ltd. In October 2001, the consortium was granted a renewal of the retention lease, and a production licence was subsequently granted in April 2003. The BassGas project to develop the Yolla field involves construction of an undersea pipeline to a processing plant onshore Victoria near Lang Lang. The project is expected to supply around 10 per cent of Victoria's natural gas needs for 15 years, with completion and first production due in the third quarter of 2004. MRT has been involved with discussions with the BassGas proponents, and Victorian and Commonwealth government agencies, regarding the necessary approvals for the project.

Woodside Energy Ltd has commenced feasibility studies into development of the Thylacine gas field, discovered in 2001 in the Otway Basin, northwest of King Island. Thylacine will be developed concurrently with the neighbouring Geographe field, in Victorian waters, and the gas will be piped to a processing plant near Port Campbell in Victoria. Production is expected to commence in mid 2006 to supply the growing southeast Australian gas market.

Collaborative studies of the Bass and Sorell basins by MRT, Geoscience Australia and the National Centre for Petroleum Geology and Geophysics (NCPGG), funded by the Western Tasmanian Regional Minerals Program, were essentially completed in 2003. These studies, which include seismic reprocessing, have provided a greatly improved understanding of the petroleum prospectivity of these basins. Further studies on aspects of the petroleum prospectivity of the Sorell Basin by the NCPGG are still underway.

Two offshore areas in the Otway Basin, west of King Island, were gazetted for competitive work program bidding in 2002, together with two areas in the Bass Basin. Bids for the two Otway Basin areas were received by the closing date in April 2003. The Bass Basin areas were re-released, with a closing date of 25 September 2003. Four areas, one in the Sorell Basin and three in the Bass Basin, were gazetted in April 2002 and are currently available for bidding with bids for Sorell Basin area closing on 25 September 2003 and the Bass Basin areas closing on 25 March 2004. MRT staff have been actively involved in the promotion of the offshore release areas, most importantly at major industry conferences.



Note: Tasmanian total includes development feasibility study

Onshore, Great South Land Minerals Ltd holds Special Exploration Licence 13/98 for petroleum, covering most of the Tasmania Basin. Stratigraphic drilling at Hunterston, on the Central Plateau, was suspended in September 2002.

Tasmanian Gas Pipeline

In December 2001, Duke Energy International began construction of the $380 million undersea Tasmanian Natural Gas Pipeline (TNGP) linking Tasmania with the Australian mainland, and bringing natural gas to Tasmania for the first time. The majority of pipe-laying activities were complete by August 2002. MRT has been closely involved with approvals for this project under the *Commonwealth Petroleum (Submerged Lands) Act 1967* and the *Tasmanian Petroleum (Submerged Lands) Act 1982*.

The TNGP transports natural gas from Longford in Victoria to Bell Bay, southern Tasmania and Port Latta via approximately 740 km of onshore and offshore pipeline. The gas is sourced from the Gippsland Basin in Bass Strait and made available, via the TNGP, to industrial and domestic markets in Tasmania.

The TNGP project will have significant positive direct and indirect economic and employment benefits. There will also be environmental benefits by substituting natural gas for fuels such as coal, oil and domestic firewood.

The project is consistent with the national objective of encouraging competition in the energy market, and there is a prospect of end use efficiency gains as industry converts from the more polluting fossil fuels to gas.

Industrial Minerals

Tasmania Magnesite NL holds retention licences for magnesite at Arthur River and Lyons River, and is actively seeking a buyer for the licences.

Mineral Holdings Australia Ltd continues to seek a joint venture partner for the development of dolomite and limestone resources in northwest Tasmania. The company intends to develop an export industry based on chemical, industrial and agricultural carbonate products.

The proposal to develop heavy minerals beach sands at Naracoopa, on King Island, by Tasmanian Titanium Pty Ltd has received all necessary approvals from the King Island Council and the Tasmanian Government. It is still the company's intention to proceed with the mine when outstanding legal issues are settled and funding is secured.

JJ MacDonald Pty Ltd has been granted a retention licence over the Maydena/Pine Hill silica flour deposit. The company has made a considerable investment in defining the resource and testing the chemical and physical properties of the deposit.

Environmental Management

The environmental monitoring of exploration programs continued with diligence and attention to detail. Regular field visits were made to ensure exploration work was being conducted in an environmentally responsible manner and that rehabilitation of past sites was successful.

Compliance auditing

In response to the Regional Forest Agreement and the RPDC CAR Inquiry, Mineral Resources Tasmania instigated a GIS-based project in 1998/1999 to develop a recording system of on-ground exploration activity. This project would allow compliance auditing of the *Mineral Exploration Code of Practice* and, in the longer term, outcome-based auditing of the environmental effects of exploration in Tasmania.

As part of Project TIGER, Deloitte Touche Tohmatsu undertook a Business Process Review of the compliance auditing system. This review documented the processes used for exploration work program approvals and monitoring. The review identified a number of crucial issues that need to be addressed when the present process is converted into MRT's corporate TIGER system. The conversion is dependent on resources or funding being made available.

Thirty-one work programs were submitted to MRT for approval during the past year. Twenty-nine of these were approved while two remained pending. Eleven of these programs were within CAR Reserves and required comment from the Mineral Exploration Working Group. Members of the Mineral Exploration Working Group attended a number of on-site field inspections during the reporting period.

The table below summarises the types of activities approved, within a broad division of Tasmania's land tenure system.

Activity	*Car Reserve System*	*High Quality Wilderness*	*State Forest*	*Crown Land*	*Private Property*	*HEC Land*
Drill Sites	8	0	71	10	17	4
Tracks (m)	0	0	3800	300	0	0
Costeans (m)	0	0	1500	0	0	0
Helipads	0	0	0	0	0	0
Bulk Samples	0	0	0	0	1	0

A total of 2.66 hectares of on-ground disturbance was recorded through the year. The distribution of this disturbance between different land tenures and activity types is shown below:

Activity	*Car Reserve System*	*High Quality Wilderness*	*State Forest*	*Crown Land*	*Private Property*	*HEC Land*
Drill Sites	0.02	0	0.16	0.02	0.01	0.02
Tracks	0.05	0	1.83	0.23	0	0
Costeans	0	0	0.30	0	0	0
Helipads	0	0	0	0	0	0
Bulk Samples	0	0	0.01	0	0.01	0
Total (ha)	**0.07**	**0**	**2.30**	**0.25**	**0.02**	**0.02**

Of the 2.66 hectares of disturbance attributed to exploration activities conducted during the reporting year, 0.66 hectares were rehabilitated.

The following table shows the area (in hectares) that has been rehabilitated for each activity and land tenure category during the year. A percentage of the area rehabilitated against the disturbances in the above table is also shown. Approximately 25 % of the area disturbed in the reporting period, for all land categories, has been rehabilitated.

Activity	*Car Reserve System*	*High Quality Wilderness*	*State Forest*	*Crown Land*	*Private Property*	*HEC Land*
Drill sites	0	0	0.01	0.02	0	0
Tracks	0	0	0.38	0.23	0	0
Costeans	0	0	0	0	0	0
Helipads	0	0	0	0	0	0
Bulk samples	0	0	0.01	0	0.01	0
Total area disturbed (ha)	**0.07**	**0**	**2.30**	**0.25**	**0.02**	**0.02**
Total area rehabilitated (ha)	**0**	**0**	**0.40**	**0.25**	**0.01**	**0**
Percentage of overall disturbance rehabilitated (ha)	**0%**	**100%**	**17.4%**	**100%**	**50%**	**0%**

Last year it was reported that 45.8% of the total disturbance for the reporting period 2001/2002 had been rehabilitated in that same period. Added to the rehabilitation conducted in the 2002/2003 reporting period, a total of 31% of all disturbances, for the combined periods, has been rehabilitated to date. The following table indicates the progressive rehabilitation figures (expressed in hectares).

Activity	*Car Reserve System*	*High Quality Wilderness*	*State Forest*	*Crown Land*	*Private Property*	*HEC Land*
Drill Sites	0.03	0	0.04	0.04	0.03	0.01
Tracks	0.18	0	0.38	0.23	0	0.03
Costeans	0	0	0	0	0.10	0
Helipads	0	0	0	0	0	0.02
Bulk Samples	0	0	0.01	0	0.04	0
Total	**0.21**	**0**	**0.43**	**0.27**	**0.17**	**0.06**
Percentage of overall disturbance rehabilitated (ha)	**43**	**100**	**16**	**90**	**94**	**71**

Because of the very low impact of gridding this activity does not feature in terms of disturbance attributed to exploration activity, although it does constitute a portion of the proposals and as such is still noted. A total of 92.6 line kilometres of gridding was undertaken in the year, with 35.4 km in CAR Reserve System areas, 18.5 km in State Forest, 10 km on Crown Land, 7.7 km in High Quality Wilderness areas and 21 km on private property.

It is a licence condition that all disturbances will be rehabilitated on expiry of the licence and prior to the return of the environmental bond.

Codes of practice

The fourth edition of the *Mineral Exploration Code of Practice* is a code under the *Mineral Resources Development Act 1995*. As specified in the Resource Planning and Development Commission 'Inquiry into areas to be reserved under the Tasmania-Commonwealth Regional Forest Agreement' this code will be reviewed at regular intervals and issued for public comment. This review will follow the release of the *Reserve Management Code of Practice*, providing adequate resources are made available, to ensure that both codes are consistent.

The second edition of the *Quarry Code of Practice* was issued in September 2000 and has been gazetted as a code under the *Mineral Resources Development Act 1995*.

Mines

The operations of Pasminco Australia Limited at Rosebery and Renison Bell Limited at Renison Bell continued to experience financial difficulties throughout the year. The Renison mine operation was closed and placed on care and maintenance in May, with the retrenchment of 160 people.

Allegiance Mining NL is planning to develop an underground nickel resource at Avebury, near Zeehan. A development proposal and environmental management plan has been submitted in support of an application for development approval to the West Coast Council.

Australian Bulk Minerals at Savage River continued investigations into future underground development of the mine from North Pit. The Main Creek tailings dam was raised five metres.

Australian Cement Industries, the owners of Cornwall Coal, acquired the Kimbolton coal mine near Hamilton. A boiler trial of Kimbolton coal was carried out at the Norske Skog paper mill near New Norfolk and provided sufficient encouragement for development of the mine to supply this demand.

The operations of Copper Mines of Tasmania at Queenstown will require the raising of the spillway on the Princess Creek tailings dam to provide increased capacity. A five metre raising of the dam wall is anticipated.

Plans for closure of the initial tailings dam at the Henty mine were approved and closure and rehabilitation was commenced.

Pasminco Mining at Rosebery completed development of a decline access into the mine and commissioning of new ore handling facilities at surface. This allowed the closure of the shaft haulage and rail transfer system.

Rehabilitation works

Rehabilitation of abandoned mining lands

Mine rehabilitation was carried out by MRT at alluvial tin mines near Gladstone, at the former Merrywood coal mine, at Storys Creek, and at gravel pits at Beaconsfield and Sheffield. Shaft protection and weed control programs were carried out at Zeehan, Mathinna, and at the Queensberry mine. Work was funded by the Rehabilitation of Mining Lands Trust Fund. A detailed report is provided later in this Review.

Acid drainage emissions from the site of the historic Mt Bischoff mine affect some twenty kilometres of the Arthur River. A Commonwealth grant from RiverWorks Tasmania, administered by MRT, is being used to fund investigations into the environmental impacts, and carry out an initial phase of rehabilitation. The initial studies were carried out by John Miedecke and Partners and Pitt & Sherry Pty Ltd.

Drainage diversions for adit water, together with limestone additions to provide alkalinity, are being carried out above the Waratah River. The entry to the Allens Workings, which also provides access to the mount, is being tidied and an interpretation shelter is to be erected. Investigations were time consuming, causing a belated start to earthworks, while subsequent wet conditions have caused the work program to be interrupted. Mt Bischoff is of interest to the local and wider community, and public consultation has been important in developing the rehabilitation plan.

Rehabilitation of the former clay mine at Tonganah continued to progress, despite the harsh summer in the area. Approval was granted to surrender of the mining lease in favour of a storage lease until the vegetation becomes self-sustaining.

Mt Lyell Remediation Program

The Department of Primary Industries, Water and Environment continued investigations into the feasibility of extracting copper from emissions from the Mount Lyell lease. Cementation used in conjunction with solvent exchange is believed to present an opportunity for improvement to the water quality in the Queen and King rivers. An Act was passed to facilitate commercial treatment and secure Natural Heritage Trust funding for the project.

Savage River Rehabilitation Program (SRRP)

This program has been modified to provide for a shorter life of the mine. Should this eventuate a greater reliance on water treatment will be necessary as compared to mitigation measures which are available through long-term open-cut operations on site. Diversion of historic seepage from Crusher Gully into South Lens Pit reduced the pollutant load by 10% for the whole site. Continued development of the alkaline rock flow through structure in Broderick Creek by Australian Bulk Minerals is delivering sufficient alkalinity for both the mine and the SRRP to meet the initial water quality objectives.

Stanhope Rehabilitation

Rehabilitation works were carried out at the abandoned Stanhope coal mine in conjunction with the landowner, using the rehabilitation bond from the former lease. A small quantity of coal was salvaged by Cornwall Coal. This was followed by regrading, spreading soil and revegetation, to provide for a return to commercial pasture.

Planning Issues

Submissions were drafted for several planning schemes which were under review.

- In the proposed Kentish scheme, access for exploration was restricted over areas where it is permitted under the Regional Forests Agreement.
- At Clarence submissions focussed on protection of existing resources at the Flagstaff Gully quarry and access to known sand resources at Llanherne.
- Planning Directive No. 2 was drafted specifically to cover tourism, recreational and land management activities in National Parks and State Reserves.

Provisions for potential exploration and mining were omitted in areas where it is permitted under the Regional Forests Agreement.

- Comments were also made on the (simplified) Planning Scheme Template.

A submission was also provided for the draft Noise Policy. This draft contradicts several long-standing planning policies with respect of extractive industries.

MRT has been providing mineral prospectivity map series to council planners under exchange of information provisions of the Partnership Agreements.

A review was conducted of Tasmania's planning schemes with respect to their treatment of areas of potential mineral prospectively.

Lease Inspections

A geographic information system has been developed to show areas of disturbance caused by mining and quarrying and subsequent rehabilitation. Surveys of leases are being routinely carried out during inspections using GPS technology.

Site meetings were held with officers of the Circular Head Council to overcome developing problems of rehabilitation and the acid drainage potential of several council pits. Procedures were agreed to minimise the likely effects of acid drainage. Quarrying operations on King Island continue to be monitored in order to encourage improvements in acid drainage management.

Instructions were issued to stop work at an unregulated sand pit adjacent to a dam at South Arm.

Tailing dams

Provisions for the safety of tailings dams continues to be of concern. Amendments to the *Water Management Act 1999* were passed by Parliament. Regulations are still to be drafted. Procedures for setting hazard rating of tailings dams were agreed by State agencies and the Tasmanian Minerals Council.

Mining heritage

Archaeological surveys were carried out at Mt Bischoff, Storys Creek and Zeehan. At Mt Bischoff historic information was reviewed and several sites were recorded to assist in the management of rehabilitation works.

Archaeological surveys and supervision were carried out at Storys Creek during rehabilitation. The purpose of the work was to minimise the possible impacts of earthworks on the historic infrastructure elements. Site surveys were also undertaken after the majority of the tailings dumps were removed.

At Zeehan, five historic mine sites were recorded to assist the Zeehan Community Development Council which is planning to develop a tourist tramway that will incorporate displays at these sites.

Heritage advice was provided to a mining lease applicant over a historic mine site near Mangana. A bush timber structure, which was exposed by low water levels in the Ringarooma River near Herrick, was recorded.

A geographic information system is used for comparisons with historic plans, and to record archaeological surveys utilising GPS technology.

Registry Section

The Registry Section maintains a number of mining tenement registers in hard copy and electronic format. The section provides advice to officers within MRT, enquirers from other agencies, the mining industry, the legal profession and the general public on a wide range of matters associated with mining tenements and legislation.

The processing of applications for mining tenements and issue of tenement documentation continues to provide the majority of work for the section's officers.

Close liaison is maintained with professional geological officers of MRT, particularly in relation to maintenance of the TASXPLOR database, monitoring of exploration expenditure, circulation of company reports, and preparation and circulation of the *TasXplorer* news sheet.

The section liaises with a number of other agencies in regard to tenement applications and provides information to field staff who monitor on-ground activity on mining tenements.

Requesting and collation of production and expenditure statistics is an important activity carried out by the section. These statistics provide the basic data for collection of royalties and assessment of exploration levels.

Thirty Exploration Release Areas were offered to potential explorers by way of the *TasXplorer* news sheet, which is circulated widely within the Australian mining community. The news sheet is sent to 354 clients of MRT by facsimile (87), e-mail (84) and post (183), and is also available on the MRT website.

Officers of the section play a key role in maintenance of the TASXPLOR and REGIS modules within the TIGER database management system.

Mining Legislation

The *Mineral Resources Development Act 1995*, which came into force on 1 July 1996, is the principal legislation relating to the management and regulation of mining tenements in Tasmania.

During the year landslip provisions under the *Local Government (Building and Miscellaneous Provisions) Act 1993* were brought under the geoscientific investigation and research sections of the *Mineral Resources Development Act 1995*.

Mineral Resources Tasmania provides information through Service Tasmania outlets, and forms approved under the *Mineral Resources Development Act 1995* are available via MRT's webpage or on disc.

Mining Tribunal

Under the *Mineral Resources Development Act 1995*, a Mining Tribunal, consisting of a magistrate, has coverage of all Tasmania.

The Act places an obligation on the Director of Mines to attempt to resolve disputes before there is a formal hearing before the tribunal. In effect this usually consists of an informal meeting, arranged by the Registrar of Mines, between the parties.

Experience to date suggests that the dispute resolution process required by the Act adequately covers most situations that would otherwise require formal determination. To date there have been no matters that have proceeded to formal hearing before the Mining Tribunal although the tribunal has formally ratified agreements reached during dispute resolution.

Tribunal matters dealt with by MRT, or referred to the Mining Tribunal during the year, were:

74049 North Forest Products v Tasmania Mines Ltd

Claim for unpaid royalty arising from mining on land owned by applicant. Meeting convened by Registrar of Mines unable to resolve matter. Hearing date set and adjourned by Mining Tribunal to allow exchange of documents. Unresolved to date.

74110 J Wrigley v Mercator Metals Pty Ltd — ELA 18/2000

Objection lodged by holder of mineral water licence. Objection withdrawn after negotiation with Registrar of Mines.

74142 Thweng Pty Ltd v RNB Trading Pty Ltd — ELA 29/2001

Objection lodged by landowner. No resolution to date.

74145 E A Cameron v Australian Sandstone (Tas) Pty Ltd — ELA 31/2002

Objection lodged by landowner. Objection withdrawn.

74146 Various objectors v Mineral Holdings Australia Pty Ltd — ELA 33/2001

Objections lodged by a number of residents of St Helens to protect heritage values of the Blue Tier area. Registrar has conducted a mediation meeting. Application for licence withdrawn.

74148 Estate of C J G Cox and L L Cox v Sapphire Trading Limited — ELA 35/2001

Objection lodged by landowner. Meeting convened by Registrar. Objection withdrawn.

74151 Estate of C J G Cox and L L Cox v Sapphire Trading Limited — ELA 2/2002

Objection lodged by landowner. Meeting convened by Registrar. Objection withdrawn.

74152 K Petersen v Waratah–Wynyard Council — 31M/1976

Claim for damages arising out of mining operations on land adjoining the claimant's property. Referred to Mining Tribunal for determination. Still to be resolved.

74157 P Sims v Adamus Resources Ltd — ELA 18/2002

Objection lodged to highlight natural values of areas within application area. No resolution to date.

Lease Applications, 2002/2003

Total number of all types of exploration rights held as at 30 June 2003

Mining Tenement	*Number*	*Area*
Exploration Licences —		
Category 1 (Metallic minerals)	98	5 669 km^2
Category 2 (Fuel minerals)	2	75 km^2
Category 3 (Construction Minerals)	7	145 km^2
Category 4 (Oil (onshore))	2	60 826 km^2
Category 5 (Industrial minerals)	18	2 502 km^2
Retention Licences —		
Category 1 (Metallic minerals)	20	118 km^2
Category 2 (Fuel minerals)	5	170 km^2
Category 3 (Construction Minerals)	5	23 km^2
Category 5 (Industrial minerals)	8	30 km^2
Prospectors Licences Issued	92	Not applicable
Permits to explore for Petroleum under the *Commonwealth Petroleum (Submerged Lands) Act 1967*	4	363 Blocks
Retention Licence under the CPSLA 1967	1	5 Blocks
Pipeline licences held under the CPSLA 1967	1	
Pipeline licences held under the *Tasmanian Petroleum (Submerged Lands) Act 1982*	1	

Leases applied for

Product	*Number*	*Area (ha)*
All minerals	2	42
All minerals and Stone	2	587
Gold	2	22
Gravel	8	80
Limestone	1	10
Nickel	1	400
Sand	4	30
Sand and gravel	1	3
Sandstone	1	5
Specimens	1	1
Stone	9	80
Stone and gravel	2	146
Storage lease	1	107
Total	**35**	**1513**

Leases granted

Product	*Number*	*Area (ha)*
All minerals	1	21
Gravel	3	50
Lime sand	1	12
Sandstone	1	7
Specimens	4	52
Stone	5	20
Stone and gravel	4	185
Tin	1	34
Total	**20**	**381**

Total number of leases in force at 30 June 2003

Principal product	*Number*	*Area (ha)*
All minerals	30	18 595
All minerals and stone	6	5 691
Clay	9	94
Coal	3	6 314
Coal and stone	1	175
Copper	1	5
Dolerite	1	40
Dolomite	3	138
Easements	21	311
Gold	17	1 525
Granite	4	50
Gravel	165	3 054
Gravel and clay	2	29
Lime sand	4	219
Limestone	13	1 301
Magnesite	1	520
Magnetite	1	55
Ochre	1	15
Peat	1	72
Quartzite	1	191
Sand	51	2 157
Sand and gravel	22	1 302
Sand and stone	9	297
Sandstone	5	39
Shale	3	35
Silica	5	437
Silica, sand and stone	1	50
Silica sand	1	20
Slate	3	165
Specimens	13	81
Stone	229	5 475
Stone and gravel	24	480
Storage lease	1	107
Tin	10	864
Umber	1	6
Total	**663**	**49 909**

Engineering Geology and Groundwater Section

This section provides geoscientific information for the management of groundwater resources, waste disposal sites and geohazards, especially land stability. By ensuring relevant geoscientific data are available to the public and private sectors, better land-use decisions can be made.

The section was involved in a number of projects and programs during the year. Enquiries from local government, other agencies and the general public for information on both engineering geology and groundwater continued as a prime function.

Engineering Geology

Land stability is a major issue in Tasmania and the current property boom is placing additional calls for information on areas throughout the State. This year the legislative mechanism to proclaim landslip A and B zones was effectively transferred from the *Local Government (Building and Miscellaneous) Act 1993* into the *Mineral Resources Development Act 1995*.

The Tasmanian Government agreed to offer a financial compensation package to eligible residents affected by a landslide at Legana. The Legana Landslip Advisory Committee (chaired by MRT) assessed applications for assistance. The Minister accepted the recommendations from the committee and as a result made offers to those residents to purchase their properties.

Much of the routine work carried out on land stability matters falls into the following three main activities.

Geohazards database

The design and implementation of a new statewide landslide (Geohazards) database as part of Project Tiger was completed. The database contains nearly 1400 records sourced from both internal MRT and external sources, although it is by no means a comprehensive record for all of Tasmania. Such information will ensure the preservation of knowledge of landslide movement in perpetuity and will be of particular interest to key stakeholders such as Local Government. MRT is encouraging the results of investigations by external parties to be fed back into the database where appropriate.

Monitored landslide program

MRT has been monitoring a number of landslide areas in northern Tasmania for a number of years but this program is currently under review, as maintaining the integrity of the survey network is becoming increasingly difficult. The results of the review will be distributed to key stakeholders and the local community. This will allow informed management decisions on the affected areas to be made, as well as deciding the future of the monitoring program. Last year a summary of all the survey data was conducted to identify landslide movement history. This year the focus is on integrating the survey data into a GIS context using high quality orthophotos and detailed topography as base information. The reports, in progress, summarise all known information about each site including reports of damage to property and the spatial extent of the landslide feature.

Landslide hazard mapping program

Work is well underway on the first of a new landslip hazard map series in Tasmania, based on a methodology that has been developed over the last three years for MRT. The first maps for completion cover the area of the Hobart Municipality and will include rockfall, debris flow and deep-seated landslide hazards. MRT is working with the Hobart City Council in partnership to ensure the maps include knowledge of past landslides and other geological information that is held in council files. Such knowledge underpins the hazard map methodology and ensures a robust depiction of the potential hazards for the area.

Groundwater

Groundwater is a precious resource in Tasmania that contributes considerably to the prosperity of the State by underpinning various forms of primary industry. As demands for water increase careful management is required to ensure long-term

sustainable use and to prevent contamination through over-extraction. Inappropriate use of groundwater is leading to salinity problems on farmland in some parts of Tasmania, while groundwater contamination associated with various forms of land use is a continuing problem. While groundwater management is under the control of the Department of Primary Industries, Water and Environment (DPIWE), MRT performs several vital functions.

Groundwater monitoring

MRT manages a monitoring network of about 36 boreholes throughout Tasmania. An ongoing process of upgrading the network continues with the deployment of new data recorders and a routine sampling program is conducted every six months. The information collected provides baseline data to enable long-term trends in water quality and quantity to be analysed. Over the last year the summer drawdown and the autumn recovery were similar to previous years in most areas, although the recent drilling of nearby irrigation bores at Montagu and Togari has affected the results of the monitoring bores.

Groundwater maps

Work on the 1:500 000 scale map of Tasmanian groundwater flow systems was completed in conjunction with DPIWE. The map and accompanying report provide information critical for the future management of the dryland salinity process in Tasmania under the National Action Plan program. Catchment maps covering the Meander River and Great Forester River systems were completed, and work started on 1:250 000 scale hydrogeological maps and 1:100 000 scale planning maps for local councils under partnership agreements.

Groundwater database

Work has finished on the data entry and verification for the groundwater database as part of Project Tiger. This database can be accessed via the internet and is helping to provide timely information to members of the public.

Groundwater quality

Groundwater quality protection issues associated with a number of waste-water reuse schemes continued to form an important element of the section's activities. This included advice on the potential affects on groundwater by this method of irrigation. In addition the section provides advice on groundwater issues relating to mining tenements.

State Groundwater Coordinating group

MRT belongs to the newly formed State Groundwater Coordinating group. Amongst the activities the group undertakes are representation on the National Groundwater Committee and the preparation of a preliminary desktop study of the Groundwater Dependant Ecosystems in Tasmania.

Information Systems and Geophysics

The main activities of the Information Systems and Geophysics Branch in the 2002/2003 year were:

- Continuation of the development of the MRT information management system by Project TIGER (Tasmanian Information on Geoscience and Exploration Resources);
- Development of the MRT website;
- Implementation of the recommendations of the Final Regional Development Plan of the Western Tasmanian Regional Minerals Program (WTRMP); and
- Training of MRT staff.

The branch also provided geophysical services and advice to MRT and our clients, and computer and network support for MRT.

The branch is structured to reflect the functions needed to achieve the required outcomes and has Project, Operations and Geophysics sections. At 30 June there was one permanent staff member in the Project Section undertaking activities related to the closure of Project TIGER and five permanent systems support staff in the Operations Section. The systems support staff are deployed within the functional areas of PC and Network Operations or Database and TIGER Support. One permanent staff member supports the Road Information Management System (RIMS). The Branch Manager is also responsible for geophysical activities.

Major branch achievements during the year included:

- completion of TIGER, the MRT corporate information management system;
- delivery of applications for MRT staff to enter, maintain and search corporate data relating to all aspects of MRT's activities including tenements, exploration reports, MRT publications, groundwater, drilling, geohazards, samples and observations, mineral deposits and geophysics;
- provision of Internet access to MRT corporate data;
- completion of a facilitated cultural change process for MRT;
- release of a quantitative interpretation of the WTRMP aeromagnetic and radiometric data;
- release of helicopter-borne frequency domain electromagnetic data over the Mt Read Volcanics, areas of shallow granite, and the Balfour area as part of the WTRMP;
- release of an interpretation report and depth section plots for the WTRMP helicopter-borne frequency domain electromagnetic survey;
- full implementation of the national reporting standards for lodging mineral exploration reports; and
- making all open-file exploration reports and MRT documents available for viewing and downloading via the Internet.

Data capture

Capture of metadata summarising technical documents relating to exploration continued throughout the year, with 196 new summaries entered and 84 summaries updated. In addition to Internet searching of the summaries of open-file technical documents held by MRT, all open-file documents relating to onshore or offshore exploration and open-file MRT publications can be viewed or downloaded in full over the Internet.

The introduction of digital reporting has meant that explorers are providing information in a form that allows ready conversion to formats for Internet viewing and downloading. All reports are now required to be in the national standard format, and compliance with the report format at initial lodgement has been in excess of 90 per cent. This has reduced the time between receipt of reports and completion of the conversion to a web-viewable format. Consultation with stakeholders to ensure closer compliance with the data formats detailed in national guidelines is continuing. GGIPAC has released a new version of the software application for producing standard headers to accompany digital data lodgements

and there will be further information programs for explorers before the use of standard headers is phased in.

All seismic sections relating to offshore petroleum exploration and held in the MRT library have been scanned and will be made available on the MRT website.

Project TIGER

Project TIGER was completed on 30 June 2003 following the launch of TIGER and the updated MRT website by the Hon. Paul Lennon, Deputy Premier and Minister for Economic Development, Energy and Resources. TIGER provides a single storage environment for MRT's corporate data, with the MRT website enabling access to this corporate data and associated metadata from anywhere in the world with Internet access.

The project has delivered a number of browser-based thin client applications accessed via the MRT intranet for MRT staff to enter, maintain and search corporate data relating to all aspects of MRT's activities including tenements, exploration reports, MRT publications, groundwater, drilling, geohazards, samples and observations, mineral deposits and geophysics. Applications were also developed for managing bibliographic references and digital objects associated with these activities. The data are delivered to clients through the MRT website using customised textual and spatial searches, and a number of basic data sets can be downloaded from the website. Where standards exist they have been taken into account during the design of applications and the relevant data model. The geohazards and groundwater module Functional Requirements Specifications were subject to external review.

Development of a single data model is central to the integration of MRT's corporate information into a single information management system. This was developed using a series of working groups that provided information on existing systems, issues to be resolved and defined the functions of the new system. These working groups will continue to oversee the ongoing operation of the information management system, the progressive migration of legacy data into TIGER, and the specifications for further development of the system.

TIGER also provides client access to open-file tenement-related information held by MRT. There are options for text or map-based searching of tenement details and searching of summaries of associated technical documents. This searching facility is a valuable research tool for a range of MRT clients, ranging from local historians to global mining and exploration companies. A development to allow on-line tenement applications is currently underway and will allow applications for mineral exploration tenements in Tasmania to be lodged from anywhere in the world. The peak monthly download total during the year was 49.6 gigabytes; this consisted predominantly of scanned open-file documents relating to previous exploration activities.

The Project TIGER Steering Committee has accepted Version 1.0 of the project Outcome Realisation Plan. The project has also supported the development of new promotional materials explaining and advertising the information resource available from MRT via TIGER. A program of activities to promote TIGER has been developed and commenced with a manned display booth at the Local Government Association of Tasmania annual conference in June 2003. Commonality between TIGER and the Road Information Management System (RIMS) was recognised and overall cost savings have been achieved by co-locating RIMS support and development with TIGER support and development.

Relevant training of MRT staff has been recognised as a key outcome of Project TIGER. All MRT staff have participated in a facilitated cultural change process which has been accompanied by an emphasis on cross-branch projects and communication within MRT and also with MRT clients. Project planning and management training has been provided at a Divisional level and targetted training has been delivered in more technical areas including ArcGIS, Java and Object Oriented programming. A set of MRT-specific project planning and approval procedures has been developed to clarify the processes required to initiate a project.

IT summary

In accordance with government guidelines, MRT replaces desktop PCs every three years and transfers the original PCs to the Schools Program. New PCs are purchased with the current Microsoft enterprise operating system and as a consequence Windows 2000 has been progressively introduced as new PCs are installed. A progressive migration to Office XP is also being undertaken.

There are four network PC servers, three of which run Windows 2000. The main PC network server has been upgraded and is now running Netware 6.1 with approximately 136 gigabytes of on-line storage. Windows 2000 servers provide anti-virus, email, intranet and image delivery services to MRT staff. Files on the corporate Unix systems are also accessed from PCs using Samba software. Automatic gathering of software inventories from desktop PCs and licence metering are part of the IT infrastructure.

A further consolidation in the number of Unix servers was made this year. There are now two Unix systems providing corporate information technology services to MRT staff. In addition there is a Unix server dedicated to development and testing for the TIGER system, a Unix web-server for the MRT intranet, and a small Unix server used for Samba and for interim storage and backup of documents scanned under the Western Tasmanian Regional Minerals Program. A further two Unix servers external to the Rosny Park building host the MRT website. The separation of the web-servers from the database servers has resulted in improved performance.

The operational group has engaged in a number of research and development projects during the year to support other divisional activities, including application development for TIGER and document scanning under the WTRMP. During a review of the Land Information Infrastructure it was recognised that there is a high level of commonality between RIMS and TIGER and subsequently the development environments for both have been co-located within MRT, with overall benefits for DIER. Some DPIWE Water Resources Branch and Transport RIMS staff have access to the MRT intranet and TIGER forms following completion of Service Level Agreements. Relocation of a number of MRT staff from the Rosny Park building to Mornington changed the level of network services required at Mornington and a new higher-speed network connection is now in use.

A new MRT website was launched in June 2003 and provides a high-speed access point for clients to access the open-file data held in the MRT corporate information management system. There is a more comprehensive structure and a more informative navigation menu than on the previous site. Open-file data within the Oracle database is replicated on a daily basis from the MRT corporate information management system to the website. The website also offers Web Map Service/Web Feature Service for a restricted number of datasets. The extremely large volumes of data associated with scanned documents and airborne geophysical surveys are not suited to routine replication and research into possible options for replication is continuing. Currently a process of irregularly timed updates is undertaken. In excess of four terabytes of network attached storage is used to accommodate these large data volumes.

Western Tasmanian Regional Minerals Program

A reference group with an independent chairman and members drawn from the Tasmanian Minerals Council, the Department of Industry, Science and Resources and MRT developed a series of projects to implement the geoscience infrastructure recommendations of the Final Regional Development Plan of the Western Tasmanian Regional Minerals Program. The Information Systems and Geophysics Branch is responsible for the acquisition of aeromagnetic, radiometric and airborne electromagnetic data over parts of King Island and western and northwestern Tasmania, and for the scanning and implementation of internet viewing and downloading of the technical documents held by MRT.

Data from approximately 114 180 line kilometres of aeromagnetic data acquired over King Island and western and northwestern Tasmania were released in October 2001 and have been well received by the mineral exploration industry. To increase the value of these data, particularly to groups not familiar with Tasmanian geology, a contractor was commissioned to work in consultation with MRT staff to produce

a qualitative interpretation of the data. The final version of the interpretation was released in May 2002. The data represent the first consistent coverage of the areas flown and allowed quantitative interpretation of a number of key areas to be undertaken by contractors in consultation with MRT staff. A report presenting the results of the quantitative interpretation has been released and is available for download from the MRT website, together with the supporting data. A new project proposal for the capture of old analogue aeromagnetic data from an area adjacent to that flown under the Western Tasmanian Regional Minerals Program has been accepted by the Commonwealth and is scheduled for completion in December 2003.

Helicopter-based acquisition of frequency domain electromagnetic data over the Mt Read Volcanics, selected areas where the interpreted depth to granite is less than four kilometres, and over the Balfour area commenced in February 2001. Equipment difficulties required the survey to be suspended after approximately 1000 line kilometres; acquisition resumed in October 2001 and was completed in April 2002, with the basic data being released in August 2002. A co-operative project was established with the School of Earth Sciences at the University of Tasmania to undertake further interpretation of the data, including production of depth section plots and an interpretation report. The co-operative project was completed in May 2003. Two Honours students have also worked on the data acquired. Several companies have applied for exploration licences after carrying out interpretation of this data.

Scanning of all TASXPLOR, PETXPLOR and DOMINFO documents was completed in February 2003. The quality of information received from the scanning contractor during this period was excellent, with few re-scans required. All open-file documents are available for viewing and downloading from the MRT website and there have been high download volumes associated with exploration area releases during the latter half of this year. Some historical reports lodged as a result of closure of exploration company offices have yet to be scanned.

Geophysics

The MRT website now has indexes to gravity base stations, to airborne geophysical surveys for which digital data are held, and to gravity stations available for clients. Where applicable the basic digital data can also be downloaded. Survey control point information can easily be retrieved from The LIST after carrying out a map-based search on the MRT website.

Preparation has commenced for conversion of geophysical data from AGD66 to GDA94. Specialised software has been received and tested on both PC and Unix platforms. Following testing it has been incorporated within some of MRT's existing FORTRAN code.

Data Management

The role of the Data Management Branch includes:

- geoscientific data management;
- tenement management services;
- management of the Geographic Information System (GIS);
- management of the Computer-Aided Drafting (CAD) system; and
- provision of support drafting services.

During 2002/2003 the capture of geological data continued, resulting in the completion of:

- nine 1:25 000 scale digital geological maps in western Tasmania (Marrawah, Smithton, Balfour, D'Aguilar, Luina, Temma, Birches, Varna, Lileah);
- four 1:25 000 scale digital geological maps in northeastern Tasmania (West Frankford, St Helens, Beaumaris, Falmouth);
- one complete and one part 1:25 000 scale digital geological maps in southern Tasmania (Tea Tree, Koonya);

Work on the 'seamless' coverage of 1:25 000 scale digital geology of Tasmania continues, with maintenance being carried out on a regular basis.

As part of the Groundwater Prospectivity of River Catchments Project, a 1:100 000 scale digital map of the Meander River catchment area was produced.

Work for the Western Tasmanian Regional Minerals Program resulted in the completion of:

- six 1:250 000 scale digital maps for the Granite Aureole Mineralisation Project;
- three 1:100 000 scale digital maps of the of the bedrock geology of the Mt Read Volcanics Belt and adjacent areas (Elliott Bay–Macquarie Harbour, South Darwin Peak–Hellyer, Que River–Sheffield);
- a new 1:500 000 scale digital map of the granitoids of Tasmania, together with a new detailed digital granitoid map of the Renison Bell area.

Ninety-five data sets of digital geological data were produced for clients.

CAD continues to be used as a support tool for many projects, with 40 maps and plans and 195 tenement maps and diagrams being produced throughout the year.

Output maps of digital geological data were produced on demand using the Agency's inkjet plotters.

Finance, Royalty and Administration Branch

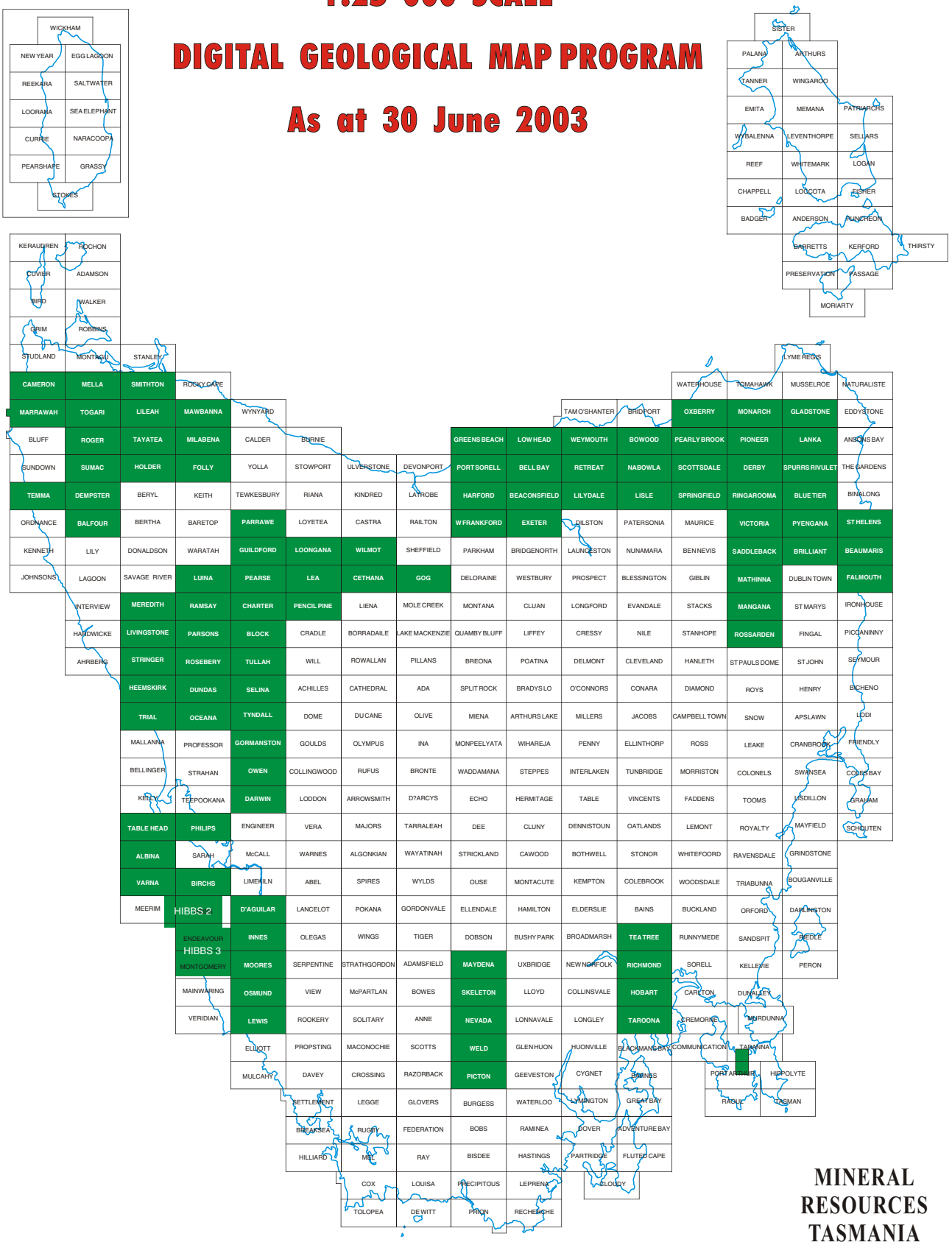
The Finance, Royalty and Administration Branch provides the corporate support function for Mineral Resources Tasmania, and is responsible for:

- efficient royalty and fee collections and assessment so that the system is properly managed and accounted for to the satisfaction of the Auditor-General;
- timely provision of a financial, accounting and administrative service to the division in conjunction with the departmental corporate services;
- production of publications relating to the interpretation and recording of Tasmania's geoscientific nature, geohazards and mineral wealth, in both electronic and hard copy form, including geological reports, promotional documents, newsletters, materials for displays, Exploration Release Area fliers, and other reports and leaflets as required;
- maintain the static content of the MRT website;
- ensure all corporate information is kept in an orderly manner that is readily retrievable; and
- maintain the MRT library collection and undertake the development and delivery of library and information services to MRT staff and members of the public.

1:25 000 SCALE

DIGITAL GEOLOGICAL MAP PROGRAM

As at 30 June 2003



Map complete

MINERAL RESOURCES TASMANIA

Tasmania

Publications

Major publications produced during the year included:

- The Mineral Resources Tasmania *Annual Review* for the year 2001/2002;
- *Mineral exploration opportunities in Tasmania. A summary of opportunities for mineral exploration and mineral resource development in Tasmania — February 2003*.

Twenty-one flyers promoting Exploration Release Areas were produced.

Reports issued in the Tasmanian Geological Record series included:

2001/03 — *A brief history of the Department of Mines — 1882 to 2000*, by C. A. Bacon.

2002/01 — *Groundwater quality investigations at the Bridport sewage lagoons*, by A. R. Ezzy.

2002/03 — *Groundwater quality investigations at the Port Sorell waste depot*, by A. R. Ezzy.

2002/04 — *Groundwater quality investigations at the Scottsdale waste depot*, by A. R. Ezzy.

2002/05 — *Groundwater quality investigations at the Smithton sewage lagoons*, by A. R. Ezzy.

2002/06 — *Groundwater quality investigations at the Blue Ribbon abattoir, Smithton*, by A. R. Ezzy.

2002/07 — *Groundwater quality investigations at the Port Latta waste depot*, by A. R. Ezzy.

2002/08 — *Groundwater quality investigations at the Stanley sewage lagoons*, by A. R. Ezzy.

2002/09 — *Groundwater quality investigations at the Stieglitz sewage lagoons*, by A. R. Ezzy.

2002/11 — *Groundwater quality investigations at the Chapel Street and Jackson Street waste depots*, by A. R. Ezzy.

2002/12 — *Drilling investigations to identify groundwater flow directions in the area north of the Tolosa Street Reservoir, Glenorchy*, by A. R. Ezzy.

2002/13 — *Geotechnical investigations at the Dorset Council clay quarry, Jensens Road, North Scottsdale*, by A. R. Ezzy.

2002/14 — *Drilling and related geotechnical investigations of the Jetsonville aquifer at the Scottsdale waste depot*, by A. R. Ezzy.

2002/15 — *Quantitative interpretation of magnetic and gravity data for the Western Tasmanian Regional Minerals Program*, by D. E. Leaman and S. S. Webster.

2002/16 — *Hydrogeological investigations at the McRobies Gully waste depot, South Hobart*, by A. R. Ezzy.

2002/17 — *The effects of waste disposal on groundwater quality in Tasmania: An overview of NHT funded project NLP13188*, by A. R. Ezzy.

2002/18 — *Western Tasmanian Regional Minerals Program Mount Read Volcanics Compilation: Report on field investigations Mt Darwin–Mt Murchison Region*, by K. C. Morrison.

2002/19 — *Western Tasmanian Regional Minerals Program Mount Read Volcanics Compilation: Updating the geology of the Mount Read Volcanics belt*, by K. D. Corbett.

2003/03 — *Brief hydrogeological investigations of the Fluertys Creek Catchment, Birchs Bay*, by A. R. Ezzy.

2003/04 — *A review of geology and exploration in the Macquarie Harbour–Elliott Bay area, South West Tasmania*, by K. D. Corbett.

2003/05 — *A brief investigation of King Island basins/sub-basins and fractured rock hydrogeological systems*, by A. R. Ezzy.

2003/06 — *The form of the King Island and Beulah granites*, by D. E. Leaman.

2003/09 — *Helicopter electromagnetic data — processing, quality control and interpretation*, by J. Reid.

Library

The library continues to be staffed by a full-time librarian, with assistance being provided two days per week. The Workplace Standards Tasmania collection, although co-located in the Rosny Park Library, is managed separately by a permanent part-time librarian.

Technical Services

The Inmagic DB/Textworks library management software was updated during the year to version 6.11.

A library assistant provided through the Commonwealth Rehabilitation Service commenced work experience in July. The assistant worked two days per week pre-cataloguing the last of the uncatalogued collection.

In September, a library assistant was employed part-time to work on the field books cataloguing project. All library staff were involved in scanning the notes for key information to be included in the catalogue records. Over eight hundred field books were entered into the DB-Textworks database during the project.

In May a part-time project officer (funded through the Industrial Minerals and Land Management branch) commenced work on organising, indexing and digitising the aerial photographs collection.

Papers with Tasmanian content from the Twelvetrees' sundries collection of bound papers were indexed onto DB-Textworks.

Collection

Work has continued on collection maintenance and improved access to information. Considerable time has been spent reorganising the journal collections, housed in both the compactus and the main collection, to maximise available space.

Scanning of company reports, Mineral Resources Tasmania reports and petroleum reports continued and more reports became available for viewing and downloading from the MRT website.

Despite the increased cost of journals, all subscriptions were renewed. Fifteen books were purchased during the year.

External reports published during 2002/2003

ANDERSEN, P.; *BOTTRILL, R. S.; DAVIDSON, P. 2002, Famous mineral localities: The Lord Brassey Mine, Tasmania. *Mineralogical Record* 33:321–332.

EDBROOKE, S. W.; *MAZENGARB, C.; STEPHENSON, W. 2003. Geology and geological hazards of the Auckland urban area, New Zealand. *Quaternary International* 103:3–21.

GREY, K.; WALTER, M. R.; *CALVER, C. R. 2003. Neoproterozoic biotic diversification: Snowball Earth or aftermath of the Acraman impact? *Geology* 31:459–462.

*REED, A. R.; *CALVER, C. R.; *BOTTRILL, R. S. 2002. Palaeozoic suturing of eastern and western Tasmania in the west Tamar region: implications for the tectonic evolution of southeast Australia. *Australian Journal of Earth Sciences* 49:809–830.

* MRT Author

Mineral Sector Overview

The 2002/2003 year continued the difficult period for the mining industry, with the prices of most precious and base metals appreciating in US dollar terms, but for the most part these gains were offset by an appreciating Australian dollar. The zinc price continued to decline.

The proposed acquisition of the Renison Bell mine by Renison Consolidated Mines NL did not eventuate and the mine suspended operations on 27 May 2003. On 24 June 2003, the parent company Murchison United NL announced that it had appointed a Voluntary Administrator to its wholly-owned subsidiary, Renison Bell Limited.

The Rosebery mine continued to perform well, with record ore production. The completion of a decline to enable ore to be hauled directly to the surface by truck has resulted in a significant increase in efficiency.

The short-term future of the Savage River mine was assured with the completion of a deal that removed debt and an unfavourable hedging arrangement, together with the finalisation of a supply contract with BHP Steel for the supply of iron ore pellets to June 2007. The mine is on a five-year close-out plan, but the feasibility of continuing as an underground mining operation is being evaluated.

The Beaconsfield gold mine continued to operate well under an administrator with a record gold production of 105,736 ounces, up 17% on the previous year, and a strong cash surplus.

The Henty mine continues to operate successfully under new owners, Placer Dome Asia Pacific.

The Mount Lyell mine maintained a high level of production and made significant improvements in efficiency during the year.

The Australian Bureau of Statistics (ABS) reported a 7.5% recovery in Tasmanian mineral exploration expenditure to $4.3 million for the year, compared with $4 million in 2001/2002. Tasmania's share of Australian expenditure decreased marginally from 0.63% to 0.59%, the lowest figure in proportional terms since statistics have been collected. MRT data also suggest a decline in total expenditure, from $5.87 million in 2001/2002 to $4.53 million in 2002/2003.

Despite the low expenditure levels, there was significant progress in the nickel exploration being conducted by Allegiance Mining NL. A new resource figure of 4.06 million tonnes at 1.5% nickel was calculated for two separate deposits at the Avebury prospect. Allegiance announced that it would commence detailed planning and planning applications for the construction of a decline into the larger deposit to enable bulk sampling, testing and eventual mining.

There was also renewed exploration activity for gold in northeast Tasmania and drilling programs were carried out by TasGold Limited at Golconda, by Diamond Ventures NL near Beaconsfield, and by AngloAustralian NL at Nabowla towards the end of the year.

Following the exploration crisis meeting convened in May 2002 by the Tasmanian Minerals Council, the Tasmanian Government committed $300,000 for the Predictive Mineral Discovery Cooperative Research Centre to construct a three-dimensional geological model of Tasmania to assist with targeting subsurface mineral deposits. The Government also committed $125,000 to mineral exploration promotion, including preparation of a promotional CD.

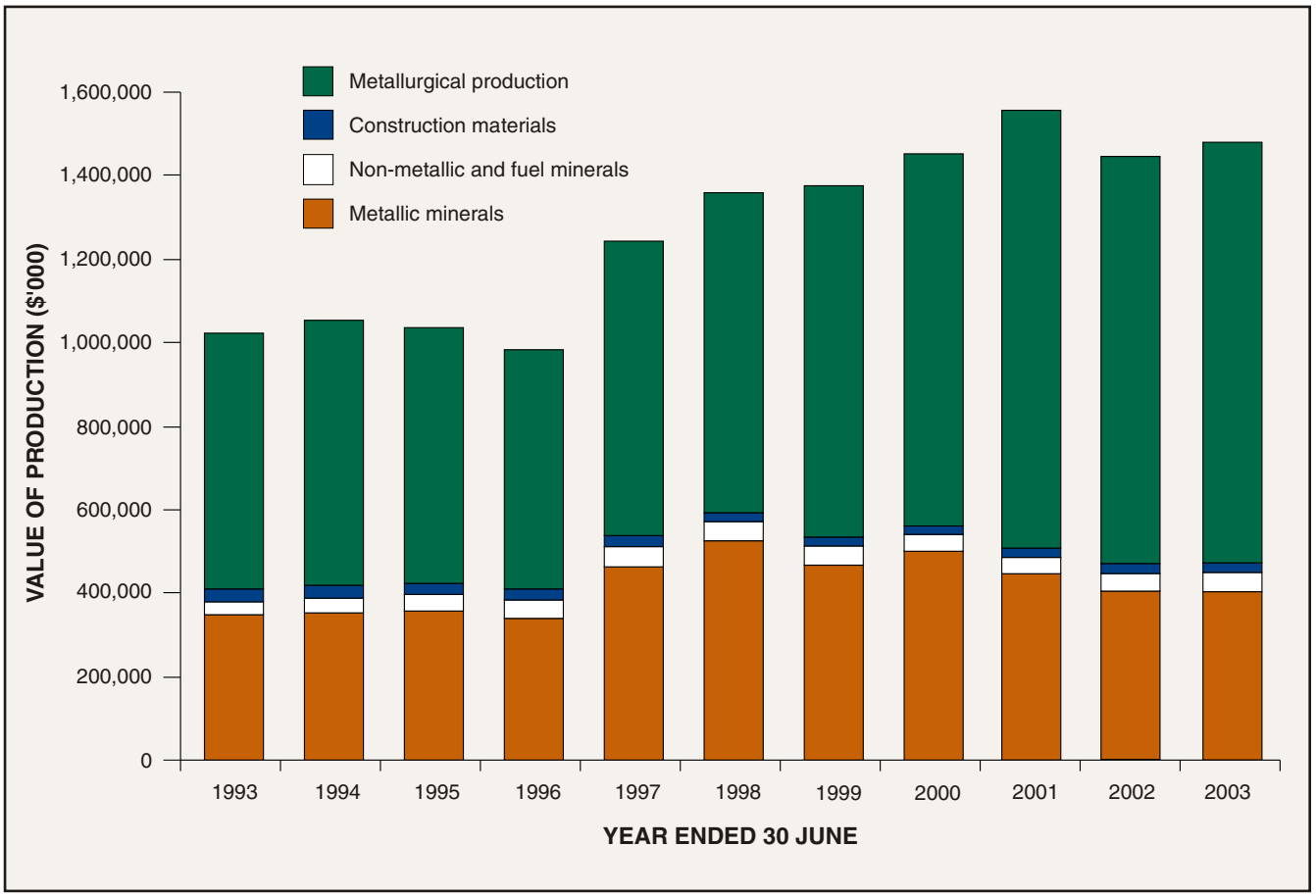
Value of the Tasmanian Mineral Industry

Year ended *Commodity*	*Unit*	*30 June 2002*[2] *Total Quantity*	***30 June 2003*** *Total Quantity*
Metallic Minerals			
Copper (assayed)	(tonne)	33 494	32 447
Gold (assayed)	(kilogram)	6 287	7 547
Iron ore pellets	(tonne)	2 151 637	2 142 278
Iron (in magnetite)	(tonne)	57 280	62 248
Lead (assayed)	(tonne)	26 950	28 727
Silver (assayed)	(kilogram)	89 925	74 189
Tin	(tonne)	7 226	4 297
Zinc (assayed)	(tonne)	81 023	86 815
Value of Metallic Minerals		$402 730 862	$404 784 863
Non-metallic, Industrial and Fuel Minerals			
Clay – Cement	(tonne)	80 240	73 007
Brick	(tonne)	18 970	28 173
Other	(tonne)	10 570	100
Kaolin	(tonne)	6 593	9 360
Dolomite	(tonne)	5 900	8 666
Limestone – Agricultural	(tonne)	135 811	138 206
Cement	(tonne)	1 664 805	1 685 005
Chemical and metallurgical	(tonne)	67 595	73 562
Other	(tonne)	65 971	63 858
Silica (glass and other)	(tonne)	163 287	128 850
Sulphuric acid	(mono tonne)	431 471	416 729
Coal (run of mine)	(tonne)	547 693	545 978
Coal (washed)	(tonne)	387 158	359 801
Peat	(m^3)	35	2
Value of Non-metallic and Fuel Minerals		$43 401 718	$41 403 223
Construction Materials			
Building stone – Freestone	(tonne)	0	48
Other	(tonne)	3 466	1 603
Sandstone	(tonne)	878	1 088
Crushed and broken stone –			
Basalt	(tonne)	724 411	702 499
Dolerite	(tonne)	891 422	826 115
Limestone	(tonne)	48 730	48 111
Sandstone	(tonne)	26	66
Other	(tonne)	203 455	85 845
Gravel (aggregate)	(tonne)	25 220	27 495
Sand	(tonne)	363 675	382 645
Other road materials	(tonne)	1 483 038	1 961 655
Value of Construction Materials		$24 898 711	$27 223 951
Total value with Australian metal prices		**$471 031 291**	**$473 412 037**
Value added production from Tasmanian and other ores			
Aluminium, Cadmium, Cement, Ferromanganese, Silicomanganese, Sinter, Superphosphate, Zinc		$972 740 360	$1 005 517 408
Value of mining and metallurgical production		**$1 443 771 651**	**$1 478 929 445**
Reported average number of employees[1]		3 452	3990

1. Not all operators report full details
2. Figures for 2002 may vary from previously published results because of late or amended returns

Value of Production, 2002/2003 and 2001/2002

	2002/2003		2001/2002		% Change
	Tonnes	A$'000	Tonnes	A$'000	
Gold	7.55	-	6.29	-	20
Silver	74.2	-	90	-	-17.6
Zinc	86 815	-	81 023	-	7.1
Copper	32 447	-	33 494	-	-3.1
Lead	28 727	-	26 950	-	6.6
Tin	4 297	-	7 226	-	-40.5
Iron ore pellets	2 142 278	-	2 151 637	-	-0.4
Total metallic minerals	-	404,785	-	402,731	0.5
Non-metallic and fuel minerals	-	41,403	-	43,402	-4.6
Construction materials	-	27,224	-	24,899	9.3
Value added production from Tasmanian and foreign ores	-	1,005,517	-	972,740	3.4
Value of mining and mineral processing production	-	1,478,929	-	1,443,772	2.4



Commodity Prices

Base metal markets generally remained weak in 2002/2003, with gold and iron ore being exceptions. There were some signs of improvement in other commodity prices such as tin and zinc, although a strengthening Australian dollar impacted on most of the gains. Increased demand from China became evident towards the end of 2002/2003, and this was having the largest impact on prices.

The value of the Australian dollar against the United States dollar has a significant impact on revenues to mining companies in Australia as most commodities are sold in USD, with companies needing to convert their USD receipts into AUD. The higher the AUD/USD exchange rate the less Australian dollars are received when converting. During 2002/2003 the value of the Australian dollar rose steadily against the American dollar from 56 cents in July to close the year at around 66 cents. Some companies enter into hedging arrangements to fix the conversion rate to mitigate the risks of a rising AUD, however hedging programs needed to cover not only currency but commodity prices, and when commodity prices fell at the same time as the dollar in 2001/2002, many companies found themselves with cash-flow difficulties.

The gold price remained relatively strong throughout the year as it was used as a 'safe haven' in uncertain times. The AUD gold price peaked at nearly $650 per ounce in early February 2003 but later fell back and was adversely affected by the steadily rising dollar.

Zinc prices fluctuated in USD terms during the financial year but started to show some signs of improvement. The strengthening AUD meant that the zinc price steadily declined in AUD terms.

Tin prices climbed steadily throughout 2002/2003, continuing a recovery from historically low levels, but again the strengthening AUD resulted in no real gains for the year.

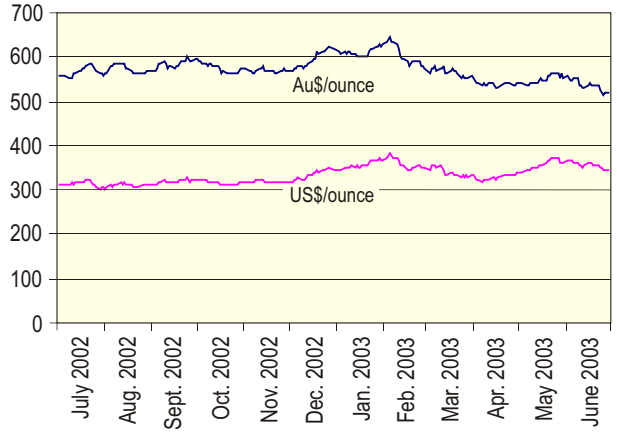
The price of copper showed some improvement mid year but was declining in AUD terms by year end. Lead prices also showed some promise mid year but ended the year down.

During the year nickel prices started to show some improvements as Chinese demand strengthened. USD price rises were strong enough to break the impact of the rising AUD.

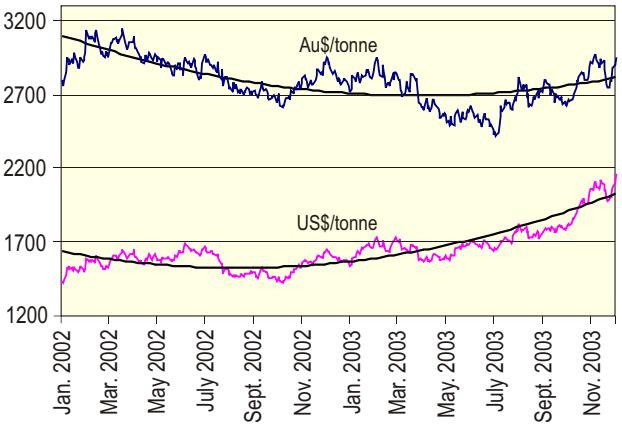
Demand for iron ore improved during the year, again as a result of Chinese demand. Producers were able to demand up to a ten per cent increase in prices, although the 18 per cent increase in the value of the Australian dollar left iron ore operations behind for the year.

Average Monthly Metal Prices
2002/2003

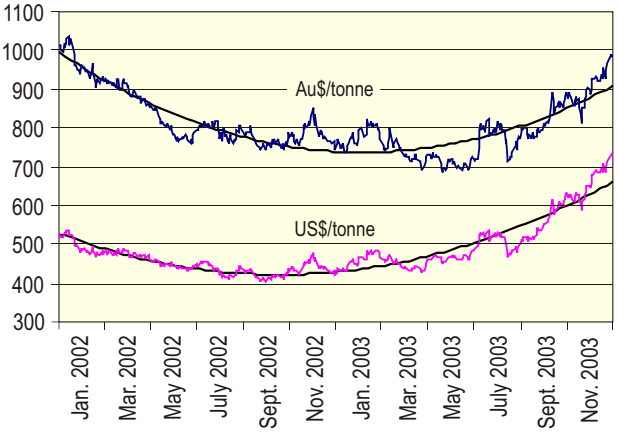
Gold



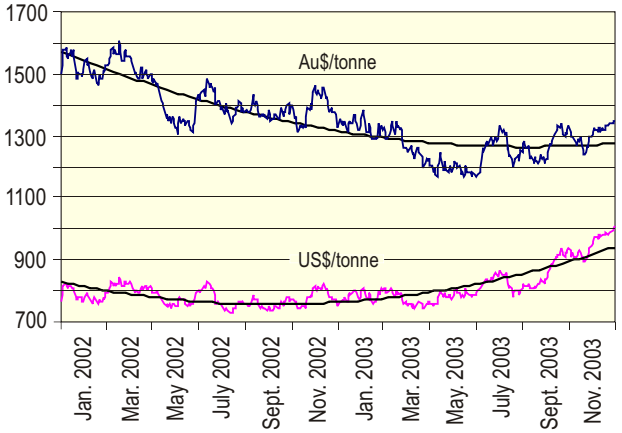
Copper



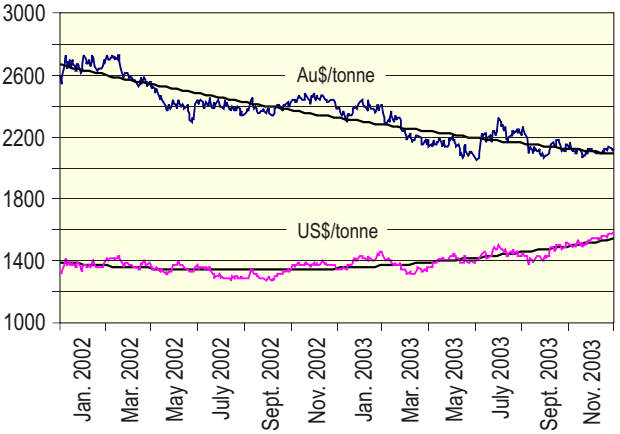
Lead



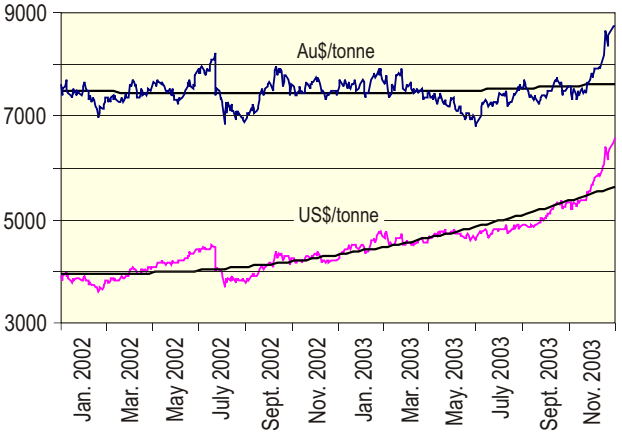
Zinc



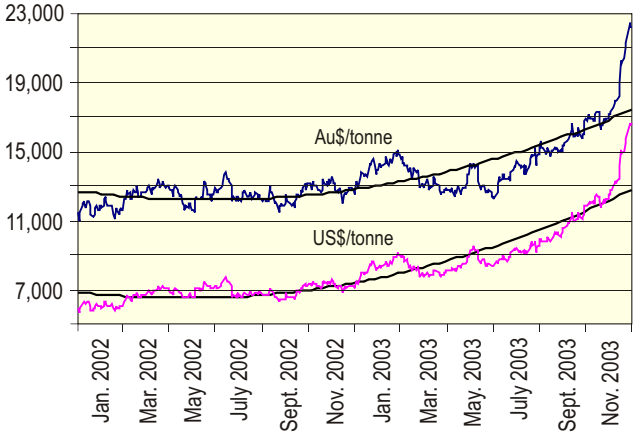
Aluminium



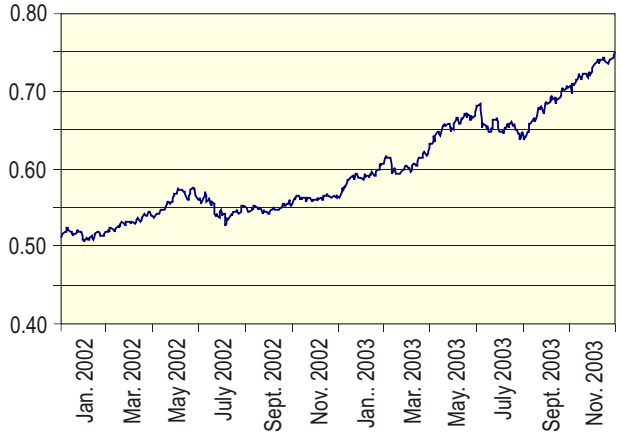
Tin



Nickel



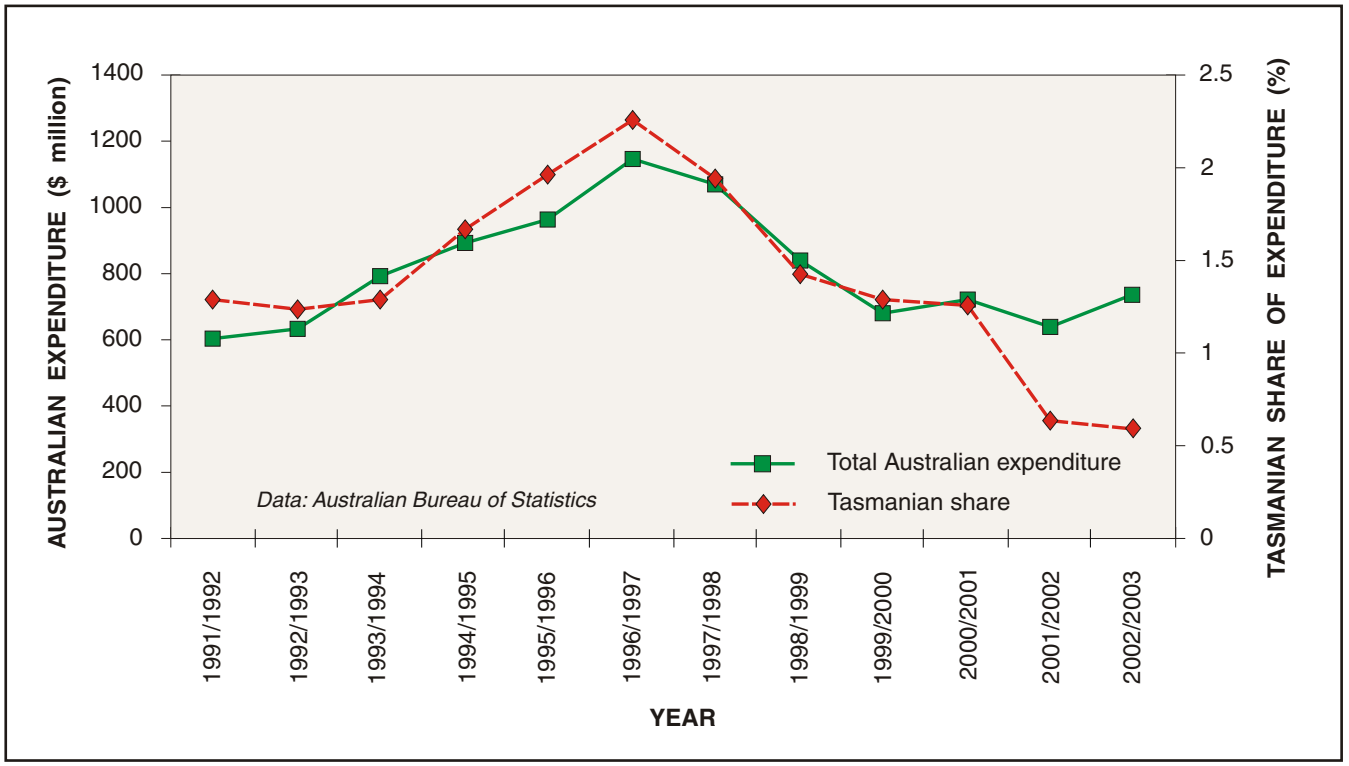
Australian Dollar : American Dollar



Mineral Exploration Expenditure

Year	Australian Expenditure ($ Million)	Tasmanian Expenditure ($ Million)	Tasmania as % of Australian Expenditure
1991/1992	603.7	7.8	1.29
1992/1993	631.7	7.8	1.23
1993/1994	792.6	10.2	1.29
1994/1995	893.4	14.9	1.67
1995/1996	960.2	18.8	1.96
1996/1997	1148.6	26.0	2.26
1997/1998	1066.8	20.7	1.94
1998/1999	837.8	11.9	1.42
1999/2000	676.4	8.7	1.29
2000/2001	721.3	9.1	1.26
2001/2002	640.6	4.0	0.62
2002/2003	732.5	4.3	0.59

Source: Australian Bureau of Statistics — Actual and Expected Private Mineral Exploration, Australia.



Review of Mineral Sector Operations — Metallic Minerals

BASE METALS

Pasminco Rosebery mine

An important change occurred at Rosebery with the commissioning of a decline to service the mine from surface and the decommissioning of the hoisting and surface rail haulage system.

Production

Ore production from the Rosebery mine totalled 782 770 tonnes @ 11.5% Zn. Lower level K and P lens were the main production sources totalling 589 764 tonnes, with the upper levels producing 118 222 tonnes from remnant mining and cut and fill stoping from 17B South. A significant quantity of ore (70 377 tonnes) was produced from decline development. Hercules Resources delivered 4407 tonnes of ore from the Rosebery North open cut during the financial year.

Development

A high proportion of capital development was required to continue extending the K and P declines at depth, in order to access future ore zones, with 2388 metres being advanced.

Operating development was predominantly in the two main lower working panels, K Lens and P Lens, where 1760 metres were advanced.

Ore reserves at March 2003

Overall reserves decreased by 395 000 tonnes compared with March 2002. This was caused by depletions from mining and revisions to the P lens resource. The decreases were partly offset by additional resources defined by exploration drilling.

Identified Ore Reserves at March 2003 comprised:

Category	*Tonnes (000s)*	*Pb (%)*	*Zn (%)*	*Cu (%)*	*Ag (g/t)*	*Au (g/t)*	*Fe (%)*
Proved	1 902	3.8	11.6	0.42	133	2.0	9.2
Probable	388	4.5	16.5	0.38	150	2.1	9.7
Total	2 289	3.9	12.5	0.42	136	2.0	9.3

Identified Mineral Resources at March 2003 comprised:

		tonnes (000s)	*Pb (%)*	*Zn (%)*	*Cu (%)*	*Ag (g/t)*	*Au (g/t)*	*Fe (%)*
Rosebery	Measured	2 414	4.3	13.3	0.52	149	2.4	10.8
	Indicated	637	5.0	18.6	0.43	166	2.5	11.7
	Inferred	5 293	5.0	16.9	0.43	171	2.4	9.5
	Inaccessible	2 625	3.4	11.4	0.69	109	2.1	14.3
	Total Meas+Ind+Inf	**8 345**	**4.8**	**16.0**	**0.46**	**164**	**2.4**	**10.1**
South Hercules	Indicated	520	2.0	3.7	0.11	167	3.0	4.6
	Inferred	40	1.2	3.2	0.10	22	3.3	2.5
	Total	**560**	**1.9**	**3.7**	**0.11**	**157**	**3.0**	**4.4**
GLOBAL	**Meas + Ind + Inf**	**8 905**	**4.6**	**15.2**	**0.44**	**164**	**2.4**	**9.5**

Exploration

Underground exploration was undertaken from July 2002 to the beginning of May 2003, with 36 078 metres being drilled. The main areas targeted were between K and W lenses and between P and K lenses. The exploration to date has been successful in defining extensions to K Lens.

Four shallow diamond-drill holes were completed to follow up a base metal anomaly along the Rosebery Fault just south of Rosebery. No significant intersections were recorded. A total of 498 metres were drilled on surface.

Mill production

Mill throughput totalled 805 277 tonnes assaying 11.40% Zn, 3.90% Pb, 0.34% Cu, 101 g/t silver and 1.7 g/t gold. This was a 6.5% increase in tonnage treated through the concentrator. The major reason for the improvement was the more consistent mine output resulting from the change over from rail to truck to surface.

Production for the year totalled:

- 141 888 tonnes of zinc concentrate @ 57.09%;
- 42 171 tonnes of lead concentrate @ 62.48% Pb, 914 g/t silver;
- 7212 tonnes of copper concentrate @ 20.2% Cu, 7.81% Pb, 2969 g/t silver, 82.5 g/t gold; and
- 444 kg of gold doré containing 67% gold, 29 % silver.

Zinc circuit quality performance improvements from last year were maintained, with output up by 2.2% due mainly to improved recovery. The clean zinc concentrate of the previous year was surpassed to give an assay of 57.09% zinc. Gold production as doré increased as a result of improved recovery. Gold head grades were down on last year, indicating a significant improvement in recovery. Copper recovery improvements resulted in a 27% increase in concentrate production. Lead concentrate output increased by 18.4% on the previous year. Concentrate production was higher due to a lower target grade and increased metallurgical performance. Contained silver metal was 33% below the previous year due to lower feed grades.

Capital expenditure

Total projects approved during year under review totalled $26.2 million. A total of $23.7 million was expended during 2002/2003, with a further $16.7 million to be spent during 2003/2004.

Major projects included underground development, exploration drilling, construction of the surface decline, the 17-level pump station, purchase of two development drill rigs, and 7-level materials handling system.

Personnel

A total of 196 people were employed at the close of the financial year. Time lost due to industrial action during 2002/2003 totalled 24 production hours. Two lost-time accidents occurred. A total of fifty Process Improvement Opportunity strategies were submitted for the year.

Community relations

Community relations remain a focus at Rosebery, with significant changes to the surface infrastructure and processes employed to handle ore. Ore is now carried by truck to the new surface ore handling facility. Two community forums (advertised through letter drops to the whole of the community) were held during the year, in addition to a number of newsletter/brochure type communications. These communications discussed the changes occurring on site, the potential impacts of these changes on the community, and the controls put in place to manage these. Visits to neighbours continued as required. A small number of formal concerns from the community were based largely on vibration and noise issues and were addressed directly with those concerned.

Environment

The operation was certified to the ISO14001 Environmental Management System standard in February 2003. The details of this approach can be found in the 2002 *Environmental Management Plan Review*. Awareness training continues to be a focus, as does the continued development of a number of defined environmental projects under the six key environmental objectives.

The development of the quality system under the framework of ISO9001:2000 has resulted in a site-wide process being developed for internal auditing. This is resulting in clear systems benefits across the business with regards to identifying opportunities for improvement in environment, safety, quality, etc.

An estimated 618 962 tonnes of mill tailings were pumped to storage in the Bobadil tailings dam during the year. A partial raising of the dam wall was completed.

The Environmental Management Plan review report, detailing environmental management at the mine, was submitted in April 2003. The Environmental Improvement Plan for Hercules expired in April 2002 and discussions continue with government to establish a new decommissioning plan.

Planned rehabilitation works continue to be undertaken mainly within the Hercules mine, various minor areas around the site/town, and the former No. 1 tailings dam area (Murchison Park). A rehabilitation audit was conducted in January 2003. A total of 0.5 hectares were rehabilitated at during the year, with 38 hectares of land being rehabilitated during the last five years.

Hercules Resources Pty Ltd

This company's operations are conducted under a sub-lease agreement with Pasminco Rosebery Mine, with Pasminco purchasing all ore production. Two people were employed full time, with one part time indirect and four direct contractors.

Small scale, selective mining operations continued in the Rosebery open cut until November 2002. The defined ore reserve and resource was mined to depletion in August 2003, in conjunction with remnant mineralisation.

Production

Total production was 4406 tonnes at 0.21% Cu, 3.18% Pb, 12.95% Zn, 129 g/t Ag and 4.9 g/t Au, giving a total production for the project of 8928 tonnes at 0.28% Cu, 5.1% Pb, 15.7% Zn, 175 g/t Ag and 6.1 g/t Au. Waste stripped for the year totalled 2300 m^3, giving a total of waste stripped for the project of 52 300 m^3.

Rehabilitation

The majority of rehabilitation was conducted concurrent with mining operations, with a final rehabilitation program to be undertaken at project completion.

Zeehan Zinc — Comstock Mine development

No ore was produced during the year. Work was focussed on earthmoving operations directed at the rehabilitation of the Central Waste Rock Dump (CWRD).

Rehabilitation/environmental

Approximately 3000 tonnes of waste rock was removed from the top of the CWRD and clay pit. All waste has been transported to the Swansea Tramway Waste Rock Dump. Approximately 95% of the CWRD had been covered with at least one metre of clay by the end of the September quarter. Clay was compacted in three layer intervals. The 30 000 tonnes of clay was sourced from a nearby clay pit. About 5% of the dump remains to be capped.

The current Swansea Tramway Waste Rock Dump has recently been re-contoured to allow truck access. Silt traps at the base of the dump are now being emptied on a regular basis. Access has also been provided for the development of the co-disposal tailings dam.

Resources

Zeehan Zinc has continued an ongoing review of work completed by Renison Goldfields Consolidated, and Western Metals. A review of the data from the newly acquired exploration leases EL20/2002 and EL30/2002 has indicated that the Oceania deposit may contain significant mineralisation.

Major Projects

A mining lease application was made to extend the southern mine boundary by eleven hectares. This area will allow the implementation of a new co-disposal plan for waste rock and tailings.

Consultant engineers were engaged to provide a brief overview of the transport network currently available to the Comstock mine site and to suggest options to upgrade this to suit the company and other local industry users future requirements.

Aurora Energy has upgraded the existing transformer to 1000 KVA which now provides sufficient capacity to run the gravity plant.

Copper

Copper Mines of Tasmania Pty Ltd — Mt Lyell mine

This company remains committed to the continued operation of the Mt Lyell site. Ongoing investment in the site has resulted in a further improvement in the cost per tonne of copper produced, as well as development of the next production level.

Employment

The operation employed 235 people. CMT directly employed 89 people, with 12 in the mine, 35 in metallurgy, 29 in maintenance and 13 in administration. The underground mining contractor, Barminco, employed 136 people on site in the areas of mine production, crushing, mobile and fixed plant maintenance, and administration. Other contractors are used as required for shutdown and project work.

Production

Production from the Prince Lyell mine was 2 762 302 tonnes at 1.25% Cu and 0.3 g/t gold. This was at similar levels to the previous year. Waste mined totalled 28 504 tonnes.

Development

Total development in ore and waste for the year was 3258 metres. A total of 229 metres of decline development were completed as well as 241 metres of access development in waste. Planned development for 2003/2004 is 2400 metres, including development of the decline to access the next level and redevelopment of a return airway. CMT will continue to use an underground mining contractor to undertake all production, development and services work in the mine.

Reserves

Ore resources at 30 June 2003, at 1% Cu cutoff, were estimated at 32.95 million tonnes at 1.37% copper and 0.34 g/t gold. The ore reserve to the 1515 metre level comprises:

Proven reserve	5.12 Mt @ 1.39% Cu, 0.31g/t Au
Probable reserve	0.49 Mt @ 1.42% Cu, 0.29 g/t Au
Total reserve	5.61 Mt @ 1.38% Cu, 0.30 g/t Au

Processing

A total of 2 608 000 tonnes of ore was processed producing 101 390 dmt of copper concentrate grading 29.81% Cu, 5.4 g/t gold, containing 30 229 tonnes of copper and 18,046 ounces of gold. Processing plant performance has improved from the previous year, as the benefits of the flotation cell and regrind mill are realised. Other improvements occurred with changes in maintenance practices and systems, allowing longer periods between scheduled shutdowns, and lower costs. Automation was introduced to the crushing circuits. Late in the year, difficulties were being experienced with wet, sticky ore for extended periods of time, reducing throughputs and performance.

Rehabilitation and pollution control initiatives

There has been a significant decline in reportable environmental incidents through a combination of engineered solutions and improved management systems. Additional drainage remediation works were completed, with sediment retention

ponds installed at contractor laydown facilities and the filter plant to assist in a reduction in solids lost from the site.

The tailings dam spillway level was raised by 2.5 metres in early 2003. Planning studies indicate that the life of the current spillway and crest configuration may be extended to March 2006. Mass balance of materials discharged from the dam indicates a significant reduction in total solids and metals discharged compared to the previous two years. This reduction has been created by the management of water levels in the tailings dam, which will also play an important role in extending the life of the existing facility.

The southern slag heap waste rock dump was capped in part with a water shedding cap during early 2003. Revegetation of the cap will be completed during late 2003 in conjunction with other small revegetation projects at the Cape Horn land fill, filter plant and wash-down bay pad.

Approximately 3.4% of the acid drainage pumped from the Prince Lyell mine has been treated by co-disposal with tailings. CMT have initiated and facilitated investigations into the treatment of acid drainage jointly with a third party and the Tasmanian Government. A proposal for treatment of the acid drainage by the third party is being negotiated with the government.

Capital expenditure and projects

Total capital expenditure for the year was $4,000,000. Major items comprised decline and access development, shaft winder and pump station automation, and the purchase of a quaternary crushing circuit.

Gold

Beaconsfield Mine Joint Venture

The Beaconsfield gold mine is managed by Allstate Explorations NL (subject to a Deed of Company Arrangement) on behalf of the Beaconsfield Mine Joint Venture (BMJV).

Employment

The operation employed a total of 122 people, with 71 employed in mining, 34 in processing, ten in administration, six in technical services, and one in OH&S. Thirty-two contractors were employed in mining, processing, and administration.

Production

Total ore produced from the mine was 221 321 tonnes at 16.8 g/t gold, with total ore milled comprising 227 908 tonnes at 16.0 g/t gold, for the production of 3289 kg gold. Waste mined totalled 101 962 tonnes.

Reserves and resources

The Identified Mineral Resource for the Tasmania Reef at Beaconsfield, as at 30 June 2003, comprised:

Measured Resource	116 000 tonnes @ 25.1 g/t Au (94,000 ounces contained gold)
Indicated Resource	376 000 tonnes @ 26.0 g/t Au (314,000 ounces contained gold)
Inferred Resource	216 000 tonnes @ 11.4 g/t Au (79,000 ounces contained gold)
Total Resource	708 000 tonnes @ 21.4 g/t Au (487,000 ounces contained gold)

The in situ ore reserve for the Tasmania Reef, as at 30 June 2003, was:

Proven Reserve	162 000 t @ 16.3 g/t Au (85,000 ounces contained gold)
Probable Reserve	478 000 t @ 18.5 g/t Au (284,000 ounces contained gold)
Total Reserve	640 000 t @ 17.9 g/t Au (369,000 ounces contained gold)

Capital expenditure

Capital expenditure for the year totalled $6.5 million. Some major new activities included:

- Completion of a 32-hole diamond drilling program to delineate further ore reserves;
- Installation of the 680 ML pump station and associated infrastructure;
- Purchase of a fourth Elphinstone R1300 loader;
- Purchase of a third Wagner MT436B truck;
- Installation of a 30" Knelson concentrator in the primary milling circuit; and
- Upgrade of mine rescue equipment.

Rehabilitation and environmental initiatives

The BMJV has developed a set of quality guidelines for mine water discharge in Middle Arm Bay. BMJV is committed to sound environmental management in the pursuit of its business and the work in Middle Arm Bay, and in the catchment generally, is ongoing.

The overall area of disturbance from the operation is 86 ha, of which seven hectares has been rehabilitated in the last five years.

Safety

The 2002/2003 year showed a positive move in safety performance compared to the preceding twelve months, with seven accidents being recorded compared to twenty in the previous year.

Placer Dome Asia Pacific — Henty Gold mine

The Henty Gold mine is 100% owned by Placer Dome Asia Pacific, with gold production subject to a gross metal royalty to Newmont ranging from 1% to 10%.

The main thrust of development activity during the year was the preparation of the Darwin ore zones for mining, particularly Darwin South. A mining contractor was engaged to accelerate decline development to the base of the Darwin South ore zone and to excavate footwall drives and drawpoints in preparation for transverse open stoping. This marks a significant change in direction for the Henty operation, which has traditionally relied upon relatively narrow along-strike bench retreat stoping. Mine planning studies on the Darwin Central ore zone indicate that it will also be extracted using a modified form of bulk open stoping.

Employment

At the end of June 2003, the operation directly employed 99 people, including 49 in mining, 15 in administration, 11 in technical services, three in engineering and 21 in processing. A further 112 contractors were employed, of which 101 were in mining, engineering and processing. Employee numbers were inflated by the use of a mining contractor to perform decline development work in the Darwin area.

Production

Ore production was 269 505 tonnes at 9.15 g/t Au for a recovery of 79,263 ounces (2465.97 kg) of gold. Production came chiefly from the Intermediate Zone (19.6%), Zone 96 (11.6%), Zone 15 (10.2%), Mt Julia (44.0%) and the Darwin Zone (14.6%). The Intermediate Zone and Zone 15 were exhausted by the end of June 2003, with very little ore left in Zone 96. Future ore production will be sourced predominantly from the Darwin Zone with supplementary production from the Mt Julia orebody.

Waste mined totalled 153 932 tonnes, of which 149 042 tonnes was horizontal development and 4890 tonnes were from internal ventilation rises.

Reserves and resources

The last published reserve figures were issued in December 2002. These gave Probable Reserves of:

- Zone 96: 60 150 tonnes @ 13.686 g/t for a yield of 26,467 ounces of gold;
- Intermediate Zone: 16 390 tonnes @ 13.903 g/t for a yield of 7,327 ounces of gold;
- Zone 15: 14 060 tonnes @ 9.631 g/t for a yield of 4,354 ounces of gold;

- Mt Julia Zone: 130 080 tonnes @ 8.612 g/t for a yield of 36,019 ounces of gold;
- Darwin Zone: 974 790 tonnes @ 10.544 g/t for a yield of 330,461 ounces of gold;
- Total Henty: 1 195 470 tonnes @ 10.527 g/t for a yield of 404,627 ounces of gold.

Major projects

A number of major projects were completed:

- A new paste plant was constructed and commissioned, with direct feed of paste down a borehole to the Darwin orebody. Unlike the existing Henty paste plant, now decommissioned, the new plant does not use crushed aggregate in addition to mill tailings and cement. The new plant can supply up to 1000 tonnes of paste per day, which will be mainly used to fill primary transverse open stopes. The delivery borehole installed as part of the paste plant infrastructure is 640 m long and 12 inches in diameter.
- The main access decline to the base of the Darwin South ore zone was completed, as were the footwall access drives on the two lowest levels.
- Two raise-bored internal vent rises were completed in the Darwin South area, allowing suitable ventilation of the main ore producing areas. One vent rise was 3.1 m in diameter and 57 m long; the other was 2.4 m in diameter and 78 m long.

Rehabilitation / Environmental

Rehabilitation of leach residue pond B was commenced using a 'mushy' closure, which consists of both wet and dry final landforms incorporating natural vegetation surrounding a central lake.

Mine development in the Darwin area started to generate significant quantities of potentially acid-generating waste rock. This was recognised during the underground exploration of the area and the Henty operation has responded by structuring the mining schedule to allow complete disposal of this material as underground stope fill.

Tin

Renison Bell Limited — Renison mine

Murchison United NL appointed Featherby Reilly as Voluntary Administrator to its wholly-owned subsidiary Renison Bell Limited in June. Operations at Renison were suspended on 5 June following a fatal accident in May. Pumping continued while the site remained on 'care and maintenance'.

Ore mined at Renison until operations were suspended comprised 471 353 tonnes for the production of 4645 tonnes of tin in concentrates. Sales of tin in concentrates totalled 3856 tonnes to the end of March. Renison's average employment figure for the year totalled 170, including contractors.

Iron Ore

Australian Bulk Minerals (Goldamere Pty Ltd)

This company is the operator of the Savage River iron ore mine and a pellet plant located at Port Latta. A total of 422 people are employed, including 181 in open-cut mining operations, 96 in concentrator operations, 126 in pellet production, and 19 in administration.

Production

Production totalled 975 688 cubic metres of iron ore and 9 219 435 cubic metres of waste, a total of 10 195 123 cubic metres mined. Of this 5 300 468 tonnes of ore were milled producing 2 199 237 tonnes of concentrate. Pellet production totalled 2 142 278 tonnes, with 2 203 557 tonnes of pellets, 49 537 tonnes of concentrate and 98 997 tonnes of chips being sold.

Reserves

Reserves at the end June 2003 comprised:

North Pit	16.1 million tonnes @ 52.7% DTR
South Deposit	3.2 million tonnes @ 51.4% DTR
South Centre Pit	3.6 million tonnes @ 44.6% DTR
Stockpiles	0.7 million tonnes @ 31.3% DTR
Total	**23.6 million tonnes @ 50.6% DTR**

The reserves for open-cut mining are sufficient for a mine life of five to six years. The potential for an underground operation in the northern part of the deposit is being reviewed using a previous study carried out by Pickands-Mather International and updates to the ore body model through recent diamond drilling.

Environment and rehabilitation

Contract weed management was undertaken within the former Savage River township on behalf of the Department of Primary Industries, Water and Environment to control broom, cotoneaster, pampas grass and gorse.

In situ classification and segregation of waste rock from pits is an important feature of waste handling at Savage River. Potentially acid-generating material is sealed in clay-lined cells in rock dumps to minimise emissions. Waste rock from North Pit and South Deposit are disposed of in this manner. Revegetation of the southwest dump continued, with care and maintenance of previous plantings. The water shedding cover over B Dump was further compacted with selected fine-grained inert waste rock. The eastern side of the dump has been covered with A-type rock to increase alkaline run off into Main Creek.

Revegetation of land to the west of the Port Latta site continued, with weed management and replanting. Financial support of the Coastcare program continues. This program is developing a Coastal Management Plan for the northern section of the Rocky Cape to Stanley east corridor.

Capital investment

Capital expenditure for the year totalled almost $9 million and included the completion of major projects valued at $5.4 million. These projects included the conversion of furnaces from oil fired to gas fired, raising the tailings dam, control system and equipment upgrades, re-routing Corinna Road and replacing the discharge end trunnion of the ball mill.

Industrial Minerals

Limestone and dolomite

Beams Bros Pty Ltd

The company operates a limestone quarry at Flowery Gully and a dolomite quarry at Cressy. Twenty-four people were employed in operations. Production for the year comprised:

Limestone for flux	15 800 tonnes
Dolomite	51 800 tonnes
Limestone for drains, water treatment	7 760 tonnes
Fines: limestone and dolomite	79 004 tonnes
Ironstone gravel	3 073 m^3
Dolomite by-product	10 147 tonnes
Scalpings	2 445 tonnes
Limestone for mixing	3 231 tonnes

Drilling was undertaken at Flowery Gully to prove limestone resources on the eastern side of the pit. At Flowery Gully 12 000 cubic metres of overburden was removed to make storage areas and for stockpiling for future rehabilitation work. At Cressy 15 000 cubic metres of overburden was stripped. Rehabilitation works continued.

Circular Head Dolomite and Trading Co. Pty Ltd

This company operates a dolomite quarry and a concrete plant at Smithton and employed 12 people (including contractors) during the year. The company was continuing to explore markets for magnesium.

Production totalled 8373 tonnes of screenings, 29 204 tonnes of powder and 14 720 tonnes of readymix concrete. Dolomite has been drilled to a depth of 1000 metres over the 120 hectares of the current mining lease.

A new bowl dust collector and six tonne mild steel spreader bin were installed. A Toyota flat tray and Sterling concrete truck were purchased.

Unimin Australia Limited

This company, formerly known as David Mitchell Tasmania, operates a limestone quarry and calciner at Mole Creek. Thirty-two staff were employed throughout the financial year, comprising 19 employed in the quarry and lime plant operation, three in maintenance, two in administration and five in management and sales. Three general casual labourers were also employed.

Production

Total limestone production was 128 364 tonnes, which included 10 833 tonnes of crushed rock and 2065 tonnes of screened rock. The remaining production was for agricultural use and calciner feed.

Reserves and resources

Feed for the kiln was predominantly high-quality limestone with some additional medium quality as this resource continues to be developed. Feasibility work on a new agricultural lime plant continues to be undertaken. Whole-of-life stripping ratio and reserves of high quality and medium quality limestone remain unchanged; further analysis will be conducted as lower levels of the quarry are reached.

Major projects

Work is continuing on a number of projects connected with ensuring a long-term future for the operation. Work was completed on an electrical upgrade at a cost of $380,000, and approval has been given for an electrical upgrade of the kiln at a cost of $450,000. An accommodation/ablutions upgrade was completed at a cost of $300,000 with numerous small OH&S and environmental projects to the value of $120,000.

Rehabilitation and environmental control

Normal procedures in line with Department of Primary Industries, Water and Environment licence conditions continued and no incidents occurred.

Stack emissions tests were carried out to verify compliance at normal operating levels. Work continues on addressing compliance at elevated kiln production levels.

The total area disturbed by operations remains at approximately 45 hectares. It is anticipated that final bench elevations and gradients on some areas will be reached by late 2004, at which time a rehabilitation program will commence.

Construction Materials

Boral ACM

Production from the various quarries totalled 688 857 tonnes of aggregate, road base and sand. A total of 29 people (including contractors) were employed.

Tree planting continued at the Launceston quarry, with 200 trees being planted during the year. Relocation of a road at the Launceston quarry will enable access to additional reserves of stone. Ongoing planting of marran grass continued at the South Arm sand pit.

Brambles Industrial Services

Brambles Industrial Services operates quarries at Western Junction, Ridgley, Talisker, Birralee and Pipers River in northern Tasmania.

Employment

Sixteen people were employed in Brambles' quarry operations during the year, including operators, supervisors, administration personnel, and contractors. The company has heavily invested in employee training of all staff. This training has included extractive industries certificates, business administration, and quality assurance to meet Department of Infrastructure, Energy and Resources specifications.

Rehabilitation environmental

On-going and final improvements were made to dust suppression systems at both the Ridgley and Western Junction quarry operations to minimise crusher-generated dust. Trials are being undertaken with other dust suppression measures, whilst improvements were made in the management of stormwater runoff at the Western Junction and Ridgley quarries.

Rehabilitation works have commenced on the 'Southern Wall' of the Western Junction quarry, while ongoing minor rehabilitation works occurred at selected sites.

Caroline Quarries

A total of 778 tonnes of gravel and sand was produced, comprising 17 tonnes of concrete gravel, 617 tonnes of road gravel and 144 tonnes of silica. An additional 14 532 tonnes of other silica products were also produced.

Approximately 1000 square metres of vegetation and topsoil were stripped to make way for a new bench while 300 square metres of old workings were rehabilitated. Hard areas were ripped then spread with natural topsoil. A small settling pond was constructed to manage runoff from the current operations.

Four people were employed on a permanent or part-time basis.

Duggans Pty Ltd

This company employed a total of four people, with an additional two part-time and one to two contractors.

A total of 51 323 tonnes of road making material, 12 170 tonnes of concrete products and 11 292 tonnes of construction materials was produced.

Continuing improvements to the sediment dams included cleaning out and enlargement. The ongoing rehabilitation of benches continued. A program to

reduce airborne material creation continued, the quarry access road was repaired, and modifications were made to the sand washing plant to give an improved continuous supply of recycled water. The company is now totally recycling all waste material from the concrete batch plant and pre-cast concrete waste is stockpiled for crushing and use in road base materials.

A CAT 980c loader was purchased during the year.

Several major projects utilising concrete from the batch plant progressed, all using crushed aggregate from the quarry and locally mined sand. An investigation into the utilisation of crushed sandstone as a potential sand product was undertaken.

Hobart Blue Metal Industries

HBMI employed 17 people and one contractor in its quarrying operations. Reported production was 315 000 tonnes of crushed rock and 21 600 tonnes of gravel.

Two second-hand dump trucks and a face loader were purchased at a cost of $600,000. A replacement secondary crusher was installed for a cost of $230,000. Planning was underway for an electrical upgrade which will start in the coming year.

Rehabilitation work at HBMI continued this year, including further work at the Clarks Sand operation.

Island Resources

Four people were employed in this operation, including two casual and one permanent employee in the mine area, and an administration manager. Contractors were hired during busy periods.

A total of 79 722 tonnes was produced, comprising 20 575 tonnes of concrete sand, 18 804 tonnes of road gravel, 16 623 tonnes of foundry sand, 10 156 tonnes of concrete block mix, 7059 tonnes of retail market sand, 3395 tonnes of concrete pipe blend, 1569 tonnes of FCR filler sand, 796 tonnes of concrete gravel and 745 tonnes of stone. Waste material remained at approximately 3% of material mined. Approximate reserves are 49.7 million tonnes of sand and 2.9 million tonnes of road gravel.

Rehabilitation was ongoing, with works including plantings of *Eucalyptus rodwayi* seedlings.

Major projects undertaken included the development of a new $40,000 fines recovery system and the construction of a drying plant valued at $250,000.

Lloyds North

This operation employed six people, including contractors. Reported production was 59 764 tonnes, of which 27 036 tonnes were for road making, 22 964 tonnes were for concrete and 9764 tonnes were used for other purposes.

Resources at the Kindred quarry include 200 000 tonnes stripped, with a possibility of another three benches, adequate for approximately 12 to 15 years supply. The Ulverstone operation has a relatively unlimited supply.

Tree plantings were undertaken at the Kindred quarry and a new bin, feed and scalper were installed at Kimberleys Road to ease dust emissions.

An $110,000 upgrade of the main crushing plant was undertaken which included the installation of new bin-feed system and scalper belt.

Norske Skog

The total number of people employed, including contractors, was 14, including one driller, two operators for the 20-tonne excavators, two shot firers, eight truck drivers and a supervisor.

The company produced a total of 72 398 tonnes of material for forestry and plantation road works. Small volumes of stripping were stockpiled in several of the company's quarries.

Norske Skog's major quarries all have a useful life expectancy of 10 to 15 years at the current rate of usage. Production volumes from these quarries vary from year to year depending on their proximity to new road construction or maintenance issues.

Three quarries are in the final stages of rehabilitation, requiring some machine work, tree and shrub plantings and fertilising. Monitoring of drainage issues arising within quarries is ongoing.

The proposed Huon link road and bridge works were delayed. Approximately 20 km of new roads were built during the year and an extensive re-sheeting program was undertaken.

Pioneer Construction Materials

A total of twelve people were employed by the company at the Flagstaff gully quarry during the year, including eight production employees, two in administration, a sub-contract driller and a welder.

Overburden stripping of RL185-170 was stockpiled for future rehabilitation work and rehabilitation continued in all areas, with a focus on eliminating pampas grass. The enclosure of all transfer points in the crushing circuit was commenced.

The main customers for products were small subdivisions and local building projects.

A development application has been submitted to the Clarence City Council to extend quarry reserves to RL 305.

RNB Trading Pty Ltd

The production of sand from South Arm totalled 76 200 tonnes, comprising 2500 tonnes of bedding sand, 11 500 tonnes of washed coarse sand, 500 tonnes of horticultural sand, and 1000 tonnes of sandy loam.

Approximately 3000 tonnes of sandy topsoil were stripped from the dune sand area. An additional 1000 tonnes of sandy topsoil were stripped from the coarse sand pit worked by GL & DH Males. Approximately 3000 tonnes of fine silt were reclaimed from a former tailings dam, to enable the reuse of the dam.

Fuel Minerals

Cornwall Coal Company NL

Duncan Colliery

Production continued throughout the year using a combination of both pillar development and pillar extraction techniques. Following the exhaustion of Blackwood Colliery No. 2 reserves, all production for Cornwall Coal was concentrated within the Duncan Colliery.

A major external audit of the pillar extraction systems was undertaken. This compared pillar extraction to the *NSW Guidelines for Pillar Extraction MDG 1005* with favourable results.

Blackwood Colliery No. 3

Pillar extraction continued until the exhaustion of the reserves in September 2002. The operations were transferred to the Duncan Colliery and the openings sealed and re-contoured.

Huntsman No. 2 open cut

Re-contouring and contour ripping was completed. An environmental study into the diversity and growth of previously seeded areas was undertaken with a view to selecting suitable species for the remaining area.

Cullenswood open cut

The bulk sample operation was commenced with some 20 000 tonnes removed and washed. The reserve is of a suitable quality for customer needs. The remaining coal will be extracted within the current area.

Kimbolton Coal

Negotiations were completed for the purchase of the Kimbolton Coal Company from White Industries in February 2003. Operations commenced in March 2003, with the site being cleaned up and the plant rehabilitated and reconstructed. A small area of overburden and coal was removed to allow boiler trials at existing customers of Cornwall Coal.

The need to selectively mine coal within the three seams to obtain a suitable product for use within the Tasmanian environment will result in discarding approximately 50% of the coal mined due to its unsuitable qualities. The structure of the overburden is such that blasting is required to break the rock and permit the use of earth-moving equipment.

As a result of the boiler trials, production has commenced to remove a bulk sample for sale within Tasmanian industry.

Production

Production for 2002/2003 totalled 522 718 tonnes. This coal was sourced from:

Blackwood No. 3	84 053 tonnes
Duncan	416 401 tonnes
Cullenswood	20 377 tonnes
Kimbolton	1 887 tonnes

An additional 2758 tonnes of coal was purchased.

Washery throughput of raw coal totalled 538 704 tonnes to produce 359 620 tonnes of saleable coal at a washery yield of 66.76%. Coal sales totalled 380 764 tonnes.

Approximately 179 084 tonnes of reject materials were deposited at the Duncan reject dump.

Reserves

Mine life will exceed 20 years at current production levels.

Exploration

Six boreholes were drilled to determine the most suitable area to excavate and form the portals for Blackwood No. 4 Colliery within the Mt Nicholas area.

A series holes were drilled at the Kimbolton mine site to determine the location of the oxidation area of the sub-crop.

Capital expenditure

A total of $123,000 was spent on plant and equipment during the year to purchase two surface transformers, a laboratory calorimeter, and to install an alarm paging system in the washery.

Mineral Processing Operations

Cement Australia Holdings Pty Limited

During the year Australian Cement Holdings merged its operations with those of Queensland Cement and Lime, forming Australia's largest cement production and distribution company. The new identity, Cement Australia, came into operation on 2 June 2003. The Railton cement plant and Devonport distribution terminal are an integral part of the new company's operation.

Employment

A total of 171 people are employed on site, with 147 people directly involved with the quarry and plant operations.

Production

Strong conditions in the mainland markets of NSW and Victoria resulted in high demand for product over the past twelve months. Production at the Railton cement plant totalled 1.101 million tonnes of clinker, which was an all time record production of clinker from the plant. From this clinker a total of 1.263 million tonnes of cement was produced.

Of this cement production 1.139 million tonnes was shipped to markets in Victoria and NSW. Cement Australia's bulk cement carrier MV *Goliath* moved the majority of this cement (1.090 million tonnes), the remainder being shipped by MV *Yarra* (27 000 tonnes) and the MV *Alcem Calaca* (22 000 tonnes). The remaining production was sold locally as bulk product for the Tasmanian market (80 000 tonnes) or bagged for both the mainland and Tasmanian markets (42 500 tonnes). Total cement despatched from the Railton factory was 1 261 502 tonnes which was just 8000 tonnes short of the despatch record set last year.

Capital expenditure

A total of $10.8 million of capital expenditure was approved during the year. This included capital for the upgrade of the plant electrical infrastructure and the factory control system. Capital was also approved for upgrades of the mine de-watering system and the kiln coal processing plant. A large number of smaller safety projects were also completed.

Rehabilitation and environmental initiatives

Rehabilitation work for the year included the continuation of the top soiling and seed spraying of overburden dumps adjacent to the cement plant. Other work included haul road rationalisation and bunding of operational roads. The clean-up of the old quarry site continued. A total of over $90,000 was spent on this work.

Environmental incidents in relation to the kiln precipitators are expected to significantly reduce with the installation and commissioning of the upgrade on the coal plant.

Development

A total of 337 130 banked cubic metres of overburden was removed as part of the ongoing development of the quarry.

COMALCO

This company operates an aluminium refinery at Bell Bay. A total of 565 people are employed, with an additional 103 contractors. The operation produced 166 162 tonnes of aluminium during the year.

Capital expenditure for the year totalled $15.437 million and included the following major projects:

- 114 kA upgrade
- Rodding room upgrade
- Cell tending machines
- CBF gas conversion
- Potline 2 rectifier transformer

- PC upgrade
- Potline crane collector rail upgrade
- Switchyard circuit breakers
- XRD replacement
- CBF fume scrubbing
- Diode cooling
- Alcan compact degasser

Pasminco Hobart Smelter

Zinc metal production at the Risdon smelter was a new production record, with a total of 253 434 tonnes of zinc being produced.

By-products produced comprised 26 321 tonnes of leach residue, 2464 tonnes of copper sulphate, 347 tonnes of cadmium and 434 792 tonnes of sulphuric acid.

Tasmanian Electro Metallurgical Co Pty Ltd (TEMCO)

TEMCO operates an electrometallurgical alloy refinery at Bell Bay. Employment totals 268 people, 228 of whom are engaged in operations. Annual production comprised 104 022 tonnes of ferro-manganese, 130 568 tonnes of silicon-manganese and 259 646 tonnes of sinter. Sales totalled 103 568 tonnes of ferro-manganese (including 1124 tonnes of ferro-manganese fines), 139 774 tonnes of silicon-manganese and 77 725 tonnes of sinter.

Rehabilitation and environmental control initiatives

- Accreditation to ISO 14001 has been maintained.
- Environmental acoustic modelling is now complete.
- Performance of the electrostatic precipitator has been improved by removing mixed raw material spillage from the feed as part of the dioxin minimisation program. Addition of urea to the raw material charge to the sinter plant has assisted in reducing dioxin emissions by 96%.
- Special projects have reduced the incidence of furnace trips, reduced PAH emissions to atmosphere, and reduced fugitive dust emissions.
- The rare and threatened species project with the Royal Tasmanian Botanical Gardens has been escalated and will now result in a database to assist restoration of rare and threatened plants to disturbed sites in northeastern Tasmania.

TEMCO is a signatory to the Australian Minerals Industry *Code for Environmental Management 2001*.

Major projects completed or in progress

Total capital expenditure was $10,982,336, which included additional day bins ($1.2 million), a replacement front-end loader ($0.95 million), purchase of a replacement 110/22kV distribution transformer ($0.82 million) and the purchase of replacement transformers ($1.13 million).

ANNUAL REPORT
Rehabilitation of Mining Lands Trust Fund

Mineral Resources Tasmania administers the Rehabilitation of Mining Lands Trust Fund to carry out rehabilitation on abandoned mine sites in Tasmania. The trust was created by the *Mineral Resources Development Act 1995*, with the government agreeing with the mining and quarrying industries to use a portion of mining royalty raised by the Act for rehabilitating Crown land affected by historic mining disturbance. A total of $611,000 was spent on this program during the year, including $255,000 from RiverWorks Tasmania. The major programs for the year were at Storys Creek and near Gladstone.

Northeast tin mines

Remedial work for the financial year continued to focus on selected sites at the abandoned Endurance tin mining site, southwest of Gladstone in the far northeast of Tasmania. Further actively eroding gully systems were rehabilitated using and refining the techniques developed over the preceding years. The practice of providing employment and skills to a local workforce continued with positive results.

Approximately 1.25 hectares of ground received intensive treatment in the 'N2' area. Here, two separate gully systems were reprofiled using an excavator. Cut off and central rock-lined drains were established, followed by the application of clean straw, jute mesh, fertiliser and local provenance seed. A further 0.55 hectares of land in the Cat Gully area received similar treatment. To the south, approximately 15 hectares of established regrowth was top dressed with fertiliser applied by tractor. The balance of last years intensively treated areas were top dressed by hand, with some sites receiving additional seeding.

At the Star Hill mine site, to the northeast of Gladstone, top dressing of approximately nine hectares of revegetation continued. Two tonnes of fertiliser was applied by hand, and this should ensure the continued vigour of regrowth at this site. All sites in the Gladstone area are now on 'care and maintenance', with no major works planned for the foreseeable future.

Expenditure totalled $60,500.

St Helens

Reported concerns regarding the degraded state of some sites to the west of St Helens resulted in the commencement of investigations into the abandoned tin mining areas off Argonaut Road. A brief report was submitted to the Trust Fund Committee and a modest project to undertake remedial work in this area was approved for the coming year. The works were designed after taking the recreational use (orienteering) of this area into account.

Merrywood

Rehabilitation works were carried out in 2001/2002 but aerial fertilising was delayed by weather conditions, being eventually undertaken in October 2002. Expenditure totalled $17,000.

Storys Creek jig tailings relocation

Remediation works have been carried out since initial investigations were undertaken in 1997. The jig tailings relocation is considered to be the last major project in the program. Funding has been provided for the program by the Trust and the Commonwealth, through RiverWorks Tasmania, during this period. RiverWorks provided $255,000 towards the cost of tailings relocation.

The consultant for the program was John Miedecke and Partners Pty Ltd, with Gradco Pty Ltd being the selected earthmoving tenderer. A total of 71 000 cubic metres of tailings were excavated and removed from the banks of Storys Creek, exceeding the 50 000 to 60 000 cubic metres of material estimated to be stockpiled adjacent to the creek. The tailings were removed to a repository at the former eastern tailings dam, where they were neutralised with 800 tonnes of limestone and

encapsulated. Revegetation of the jig tailings repository was completed in July 2003.

Work also included safety fence construction at two exposed adits, one previously buried by the jig tailings, and limestone treatment of the exposed topography on the site.

Expenditure totalled $410,800.

Balfour

The possibility of undertaking rehabilitation at this site in far northwest Tasmania was investigated. As well as the effects caused by historic copper mining, tin mining ventures have left a considerable area in need of rehabilitation. A brief report was submitted to the Trust Fund Committee. Funding was approved for the first phase of a three-year rehabilitation project, planned to commence in the coming year.

Shaft safety and weed control

A shaft was filled at Mathinna and a galvanised steel grating is being constructed to cover the Florence shaft near Zeehan. The engineering design for these works was undertaken by Thompson and Brett Pty Ltd, with construction being carried out by The Engineering Company Pty Ltd. The start of this program was delayed until the completion of the Storys Creek program. It is anticipated that work would be completed in August 2003 following delays in the delivery of materials for the steelwork. This program was carried out in conjunction with the Zeehan Community Council, which is developing the area for tourist access. Expenditure on this program to date has totalled $15,500.

Gorse spraying was carried out at the Queensberry mine near Zeehan by the Parks and Wildlife Service at a cost of $5,000.

Quarry rehabilitation

Seed was applied to gravel pits at Beaconsfield to complete a project commenced in 2001/2002.

A steep, disused gravel pit at 'The Badger' near Sheffield is visible from the town. A bench was cut which will form the foundation for a vegetation screen. Drainage was also improved, and steep slopes protected with jute matting before seed was applied. If this trial proves stable a similar treatment is proposed in an adjacent visible pit. Conservation Volunteers Australia was engaged to carry out the seed application on both projects. Expenditure totalled $23,500.